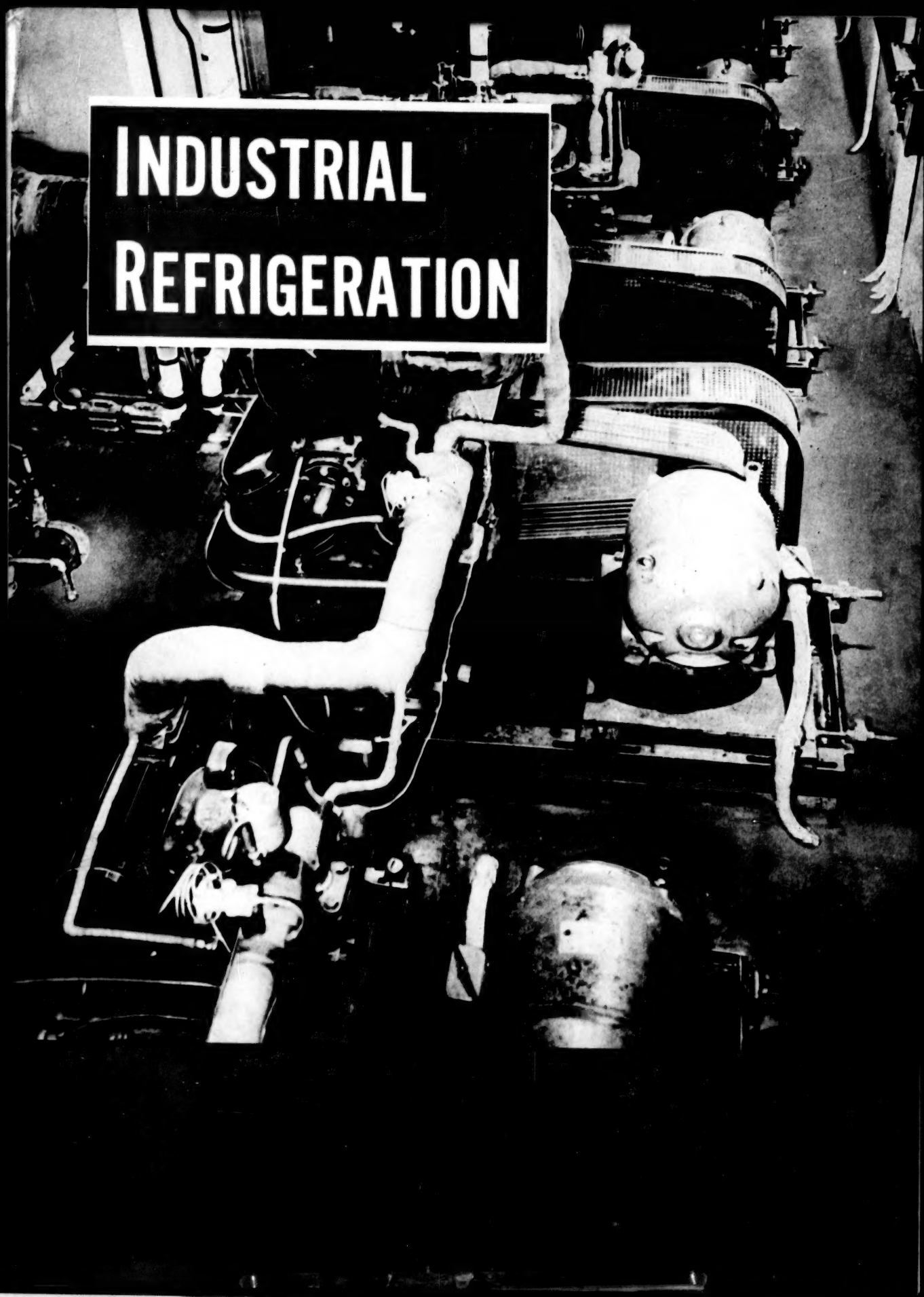
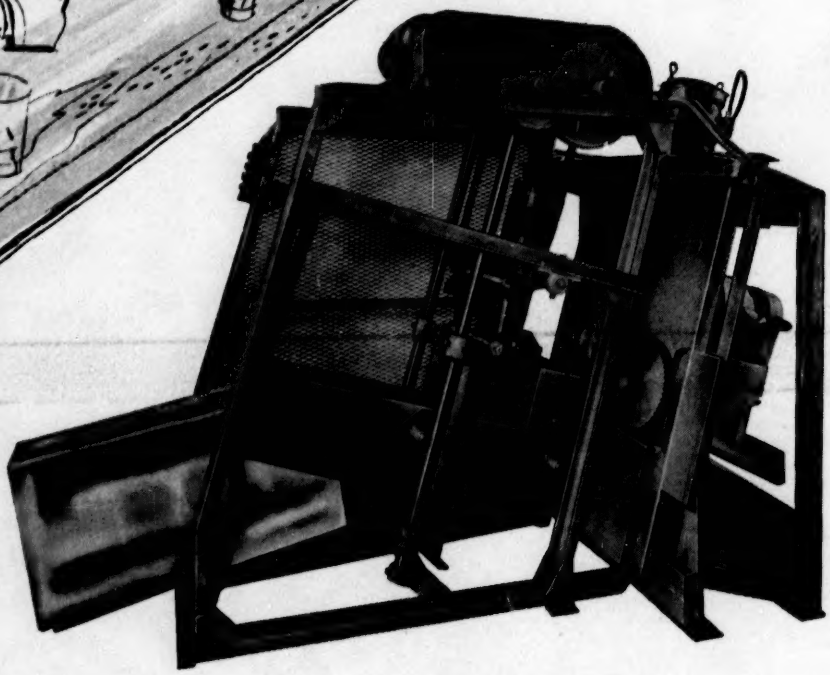

INDUSTRIAL
REFRIGERATION

26,000
H.P.H.*

* Highballs per Hour: Using one cube per glass, it would take 73 bartenders—working full time at ten seconds per drink—to keep up with the output of this G-W super-cuber.



Completely automatic, this Gifford-Wood Type A Cuber shoots out perfect ice cubes at the rate of 26,000 per hour and minimizes ice waste. It accommodates a 300- to 400-pound cake which is held firm on the loading plate, aligned with the precision cutting saws. And, as soon as this first cake is ¾ cut, a second cake slides easily into place pushing the remaining quarter into the saws. This means no waste—every piece of ice is saleable. There's a further benefit, too—all parts coming in contact with the ice are not only sturdy, but completely corrosion-proof—your guarantee of minimum maintenance cost. For full information, write for Bulletin 488.

GIFFORD-WOOD CO.

Since 1814

HUDSON, N. Y.

New York 17, 420 Lexington Avenue — St. Louis 1, Railway Exchange Bldg. — Chicago 6, 565 W. Washington St.

Pacific Coast Representative:
Western Ice Equipment Company, 420 Market St., San Francisco 11

Scarer — Breaker-Elevator — Conveyor — Breaker

VESTIBULE TYPE TRACK DOOR

YEARS OF SATISFACTION

"Butcher Boy"

Quality Since 1885

WHY "BUTCHER BOY" DOORS ARE THE FINEST REFRIGERATOR DOORS BUILT!

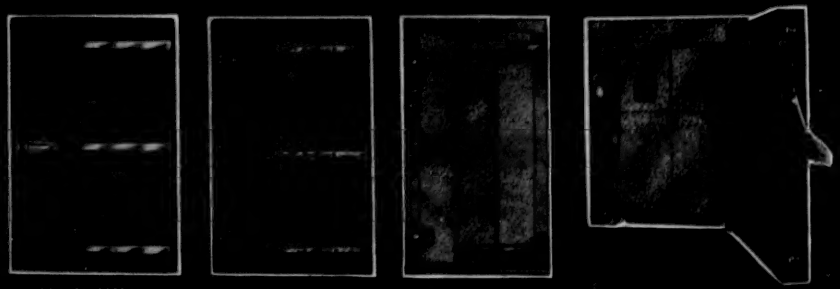
These Exclusive Features Furnished At No Extra Cost

DOOR STRUCTURE

HARDWARE

APPEARANCE

When a Man Thinks Twice ...He Makes Comparisons



COOLER FREEZER

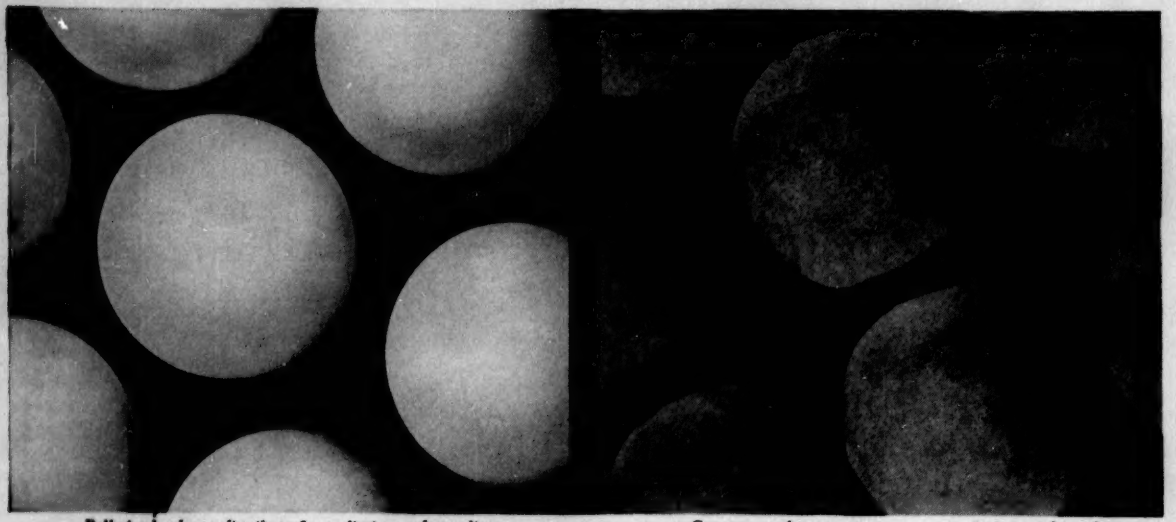
.052 PLYWOOD

ON TEMPERATURE

SUPER FREEZER OVERLAP

BUTCHER BOY REFRIGERATOR DOOR CO. HARVARD, ILLINOIS

acid causes refrigeration system breakdown!



Pelletized spheres distribute flow, eliminate channeling. *Greater surface area traps more sludge and acid.*

AN•DRITE

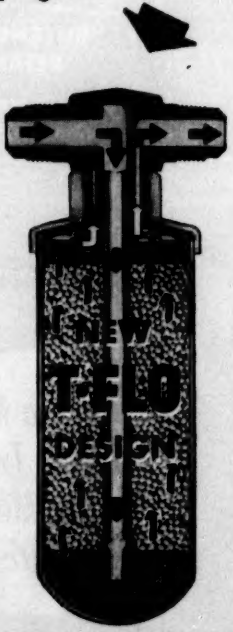
(ANSUL-TREATED 100% ACTIVATED ALUMINA)

removes acid!

Activated alumina in pellet form makes Ansul's new Andrite the double-duty desiccant. Its thousands of fast drying surfaces dry deeper—pulling moisture content way down. But even more important, Andrite removes acid, cleans up the chemical condition that causes sludge and corrosion—the major cause of refrigeration system breakdowns.

Designed for the revolutionary Ansul T-Flo Drier, Andrite won't break down or dissolve to plug filters or damage compressors. And the drier is easy to install, too. Even replacement of the drier cartridge saves time, because it screws in like a light bulb. And no tools are needed. For fewer callbacks, speedier servicing, change to Ansul. And be sure to give new equipment double protection in acid and moisture removal. Use Ansul T-Flo Driers with Andrite.

For more information or answers to your refrigeration problems write to: Ansul Chemical Company, Refrigeration Division, Dept. D-62, Marinette, Wisconsin.



SCREWS IN LIKE A LIGHT BULB!

DuPont "Freon," non-foaming oils, sulfur dioxide, methyl chloride

ANSUL

The Mechanical Refrigerator Car Story

Washington, D. C.

I was well pleased with the way you presented our story on the mechanical refrigerator cars we have in service and on order, also the pictorial sequence showing the construction of one of the mechanical cars in our Alexandria, Va. Shops. It was an excellent job, and I appreciate your interest and cooperation in presenting it to your readers.

JNO. C. RILL, President
Fruit Growers Express Co.

Likes Dairy Article

San Francisco, Calif.

Mr. Shively and I join in expressing our appreciation for the well written and accurate article on the Spreckels Russell Dairy, appearing in the December issue of INDUSTRIAL REFRIGERATION. We trust that in the future we will have for you other plants of interest. With best personal regards, and Compliments of the Season, we remain

H. E. BOUDREAU
Cyclops Iron Works

Freezer Floor Heaving

INDUSTRIAL REFRIGERATION continues its excellent cooperation by publishing reports of work on frost heaving of floors. Its November number contains an article by A. W. Rupp of V.C. Patterson & Associates, Inc., York, Penn., on methods and costs of correction of frost heaving. The Patterson Corporation uses a system in which electric heating elements are installed under buckling floors without interference with use of the room. Two or three months are said to be required to lower the floors to previous levels. Floors up to 7,000 sq. ft. and larger have been corrected. Pushing pipes under floors is the method used chiefly, but if location makes this impossible, vertical installation of pipes (through the slab) is used.—TRRF Bulletin.

Perishable Loot

TWO bandits were waiting for John Cirnigliaro when he closed up his supermarket at East Meadow, Long Island, and emerged carrying a large package. As Cirnigliaro approached his auto in a parking lot the two young men ordered him to "hand over the bundle". Cirnigliaro obeyed and the men fled. On the way home Cirnigliaro picked up another two quarts of ice cream to replace the two taken by the bandits.

Industrial Refrigeration

formerly **ICE AND REFRIGERATION**

Now in its 63rd Year of Publication

J. F. NICKERSON, FOUNDER

Vol. 128 **February, 1955** **Number 2**

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The Cover:

Four of fourteen Frick condensing units at the Sperry Gyroscope Company environmental test laboratory. "Freon-22" is the refrigerant. All automatically controlled, the compressors are arranged for selection of multi-staging compressor-condensing phases required for low temperature to minus 100 F. See story on page 50.

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What's New

MACHINERY
APPLIANCES • PROCESSES

New Spray Nozzle For Cooling Towers

COOLING tower efficiency can be raised by a new spray nozzle known as Aspir-Jet. The swirling, atomizing action of the water as it goes through the Aspir-Jet, it is claimed, means more efficiency by increasing water break-up and

New Aspir-Jet spray nozzle

distribution. Better air to water mist contact, results from the aspirating feature, at much lower than normal pressures. These nozzles will last-indefinitely because they are formed from butyrate plastic and are highly resistant to corrosion and errosion. The Thermal Agency, 1515 Dallas, Houston, Texas, is national sales agent.

Lunkenheimer Introduces PVC Valve and Fittings

FIRST all molded PVC valves and fittings, designed and engineered by Lunkenheimer have been patented and registered under the name "Luncor". The

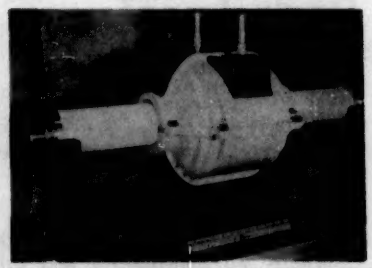
Sectional and exterior views of the "Luncor" PVC valve, product of The Lunkenheimer Company

new valve resists most chemicals used in industry. The "Luncor" valve's exclusive molding process gives the PVC material exceptional strength, protects its natural corrosion-resistance, and substantially reduces manufacturing costs. The valve will be marketed at a price lower than stainless steel and other alloy valves.

Base material used for the new valve is polyvinyl chloride (PVC), which is now available in the form of corrosion-resistant piping. It is molded in rigid form, suitable for pressures up to 125 pounds and 150 degrees temperature. The valve is presently available in a Y-type globe design. A complete line of plastic fittings made of the same material is also available. These include caps, couplings, plugs, unions, reducing bushings, flanges, 45-degree and 90-degree elbows, and tees.

New Magnetic Flow Meter

A NEW electromagnetic flow meter, designed for 2 to 8 inch flow lines, has been introduced by The Foxboro Company of Foxboro, Mass. This new instrument was publicly shown for the first time at the Instrument Society of America Exposition in Philadelphia, September 16 through 23. Incorporating all the unique advantages of electromagnetic metering, the instrument is additionally rated for unlimited maximum flows.



New Foxboro Magnetic flow meter

The meter will measure the volume flow rate of any liquid of sufficient conductance and velocity. Unaffected by the pressure, viscosity, density or changes in conductivity of the flowing liquid, it is recommended for aqueous solutions, slurries, acids and other corrosives, in addition to food and drug products requiring sanitary processing.

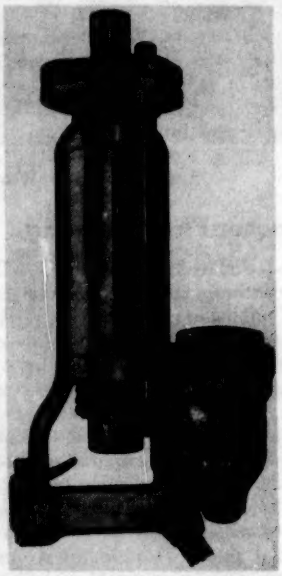
One application limitation to be considered in connection with the new meter is the conductivity of the liquid to be measured. Foxboro engineers have defined that conductivity limit at 200 microhms and, since the conductivity of the two common refrigerants, freon and liquid ammonia, is essentially zero, this meter would not be able to handle them.

The unit consists of a nonmagnetic flow tube, with an insulating liner containing flush-mounted metallic electrodes, surrounded by an AC electromagnet. When conductive liquid passes through the tube, an alternating voltage is set up between the electrodes which varies linearly in proportion to the rate of the flow. Lead wires from the electrodes transmit this voltage output to a new type Dynalog (electronic) Recorder, producing a chart record in appropriate units of flow.

Over-all accuracy is claimed to be within ± 1 percent of the scale span, from maximum flow down to zero flow, despite such factors as turbulence, dirty flow, etc. Foxboro's meter produces no more pressure drop than a length of pipe equivalent to the meter tube. Complete specifications are available in a technical report, TI 27-A-71a.

New Hammer Drill

AN ADDITION to its line of Electromagnetic Hammer Drills, the Model 27-RO with a maximum drilling capacity of three-inch diameter holes, has been brought out by the Syntron Company, 168 Lexington Av. Homer City, Pa.



New electromagnetic hammer drill

A change in the construction, which has increased the power, together with the use of a core drill makes possible the maximum three-inch diameter hole drilling. Until the development of this new hammer, the maximum hole drilling capacity was limited to two-inch diameter holes.

This new electromagnetic hammer drill, like other models in the line, is designed to speed up quantity hole drilliing in concrete and masonry. In addition to the power required for such work, the hammer drill features automatic rotation of the drill bit. This automatic rotation is accomplished by a simple rubber ratchet mechanism, which utilizes the recoil of each blow of the hammer piston to slightly turn the bit, thus the 3600 blows per minute (from 60 cycle current) of the hammer piston rotates the bit with suitable torque at the right speed, eliminating the manual quarter turning of a drill bit and reducing operator fatigue.

New Pressure Relief Valve

THE addition of another ASME rated Pressure Relief Valve to their line was announced recently by R. E. Moore, Executive Vice-President of Bell & Gossett Company, Morton Grove, Ill.

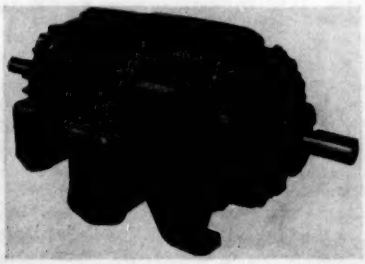
New Bell & Gossett pressure relief valve

The new valve will be called the No. 750 and has a relieving capacity of 750,000 Btu/hr. It, like all other B&G ASME relief valves, employs a new type of silicon disc seat. Thorough tests have proven this material to be impervious to excessive temperatures and but a very small pressure differential is required to close the valve after pressure is relived. The possibility of steam flash is thus eliminated and positive seating insured under all conditions.

The other ASME relief valves that are available, explains Mr. Moore, are the No. 175, 250, 350, 480 and 1050 sizes. Each number refers to the valve capacity in thousands of Btu/hr when relieving at 30 psi. ASME valves can be furnished for pressure settings from 15 psi through 125 psi. Catalog GD-1154 is now available on the company's full line of valves.

New Wound-Rotor Motor

WHAT is claimed to be the first rib-type enclosed, fan-cooled wound-rotor motor to be made with slip rings, brushing rigging, rotor and stator inside a single frame enclosure has ben introduced by Allis-Chalmers Manufacturing Co. Milwaukee, Wisc. This explosion-proof wound-rotor motor is first to bear Underwriters' Laboratories label; and the new unit is available at 1800 rpm and slower speeds, in frames 284 and 505, in standard enclosed or explosion-proof construction.



New Allis-Chalmers rib-type enclosed, fan-cooled wound-rotor motor

Dry Ice Loading Chart

A DRY ice loading chart for estimating dry ice needs in shipping perishables by trailer is now being distributed to trucking companies for their drivers by The Liquid Carbonic Corporation, Chicago. This chart, four inches in diameter,

Dry Ice Loading Chart by Liquid Carbonic Corp

shows how much dry ice is required on a hourly basis to maintain the loading temperature of a precooled cargo under various combinations of trailer size, thickness of insulation, outdoor and lading temperatures. Use of this chart will enable truckers to accurately estimate dry ice needs—thus producing dry ice savings and more favorable temperature control.

New Thermaliner Insulated Safety Shoe

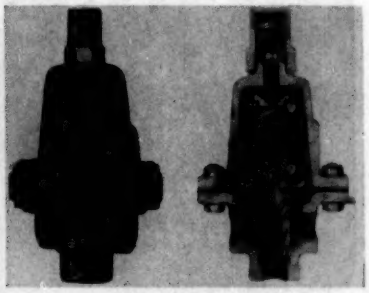
A SAFETY shoe developed for refrigeration departments, ice plants, etc., wherever feet are exposed to extremes of heat or cold has been introduced by Lehigh Safety Shoe Company, Emmaus, Pa. The entire upper is padded with a thin

New Lehigh Safety Shoe

layer of foamed vinyl that contains tiny "sealed-air" bubbles, the same principle used to insulate the home against winter cold and summer heat. The vinyl padding is claimed superior to other insulating materials because it does not absorb moisture, perspiration, oil or odors. All styles include steel toe protection.

Floating Ring Valve By Cash Manufacturing

THREE bulletins are now available which describe and illustrate Cash Acme's all new type FR back pressure relief valves. This completely new patented series is available in pipe sizes from ½-inch to 2-inch in iron, bronze, stainless steel or monel bodies, and is suitable for pressures up to 400 psi.



Exterior and sectional view of new type FR back pressure relief valve.

The patented floating ring principle is the heart of the new valve (see illustration). By removing substantially all of the friction caused by drag of a piston and cylinder, according to Cash Mfg. Corp., the valve has gained unusual sensitivity, high capacity, good closure, and generally outstanding performance. This new "floating ring" element is free to move laterally in any direction to "find" its own perfect alignment with the spherical seat disc. This compensates for all unavoidable misalignments. The combination of the spherical seat disc and floating ring eliminates any need for piston and cylinder, with small ports and passages, sliding fits, close tolerances, and other internal complications, and allows the valve to be almost frictionless in operation.

The valves are fully adjustable, by means of an adjusting screw under the closing cap. The Type FR Valve has three connections two side inlet connections and one bottom discharge connection. The valve may be installed in straight-through fashion or it may be installed "angle type" with one of the side connections plugged. The valves have been thoroughly field tested.

Corrosion Resistant Primer Developed by Pennsalt

LOCKPRIME, a corrosion resistant liquid primer for new or corroded steel surfaces, has been developed in the laboratories of the Pennsylvania Salt Manufacturing Company. Applied by brush or roller directly from the can, it provides resistance to under-cutting by corrosion when cover coats are mechanically damaged.

On either sandblasted new steel or wirebrushed rusted steel, it is claimed to form a tight adherent bond to the surface and provides excellent adhesion for following top coats of Pennsalt NeoCoat (liquid neoprene) or Pennsalt Thickcoat, a chlorinated alipathic hydrocarbon. It is equally effective in acidic and organic atmospheres.

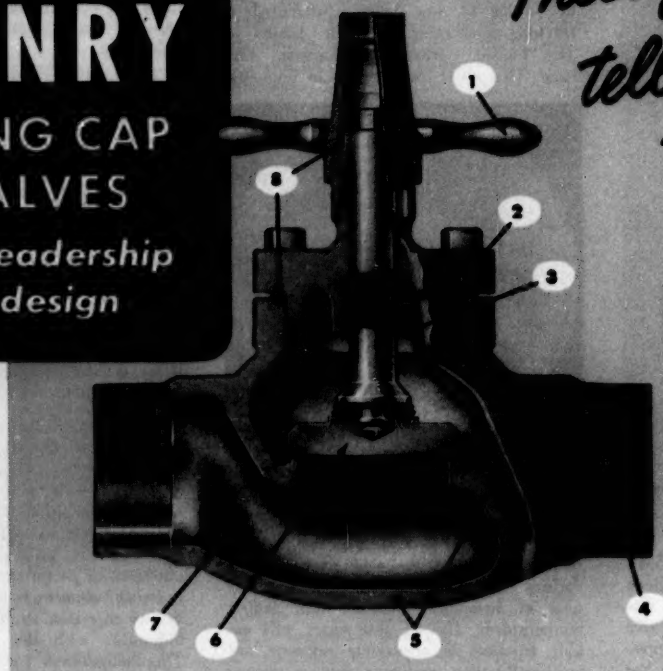
Back of the Unprecedented demand for

HENRY

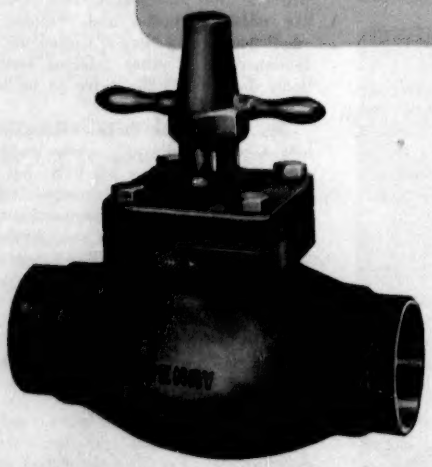
WING CAP VALVES

is a Leadership in design

These features tell the story



1. WING CAP—with stem operating socket.
2. BOLTED BONNET for maximum safety.
3. BACK SEATING—can be repacked under pressure.
4. VALVE SIZE IDENTIFICATION—on Bronze body.
5. HEAVY WALL—Bronze alloy or Semi-steel for maximum strength.
6. PATENTED, NON-ROTATING SELF-ALIGNING SWIVEL DISC. Easy positive sealing. Minimum seat wear. Chatterproof.
7. FULL CAPACITY FLOW THROUGHOUT.
8. FULLY RETAINED POSITIVE SEALING GASKETS.



Available in bronze alloy and semi-steel types. Sizes range: ⅜" to 5⅛" O.D.S. and ½" to 2" F.P.T. Flanged valves available with brass O.D.S. or steel butt weld adapters, sizes 1⅜" to 5⅛".

Year after year Henry Wing Cap Valves become more popular on both government and civilian refrigeration and air conditioning installations because of the high inherent quality of the valves and their features of design and construction. No other similar product carries such a universal recommendation by wholesalers or is in such wide demand among contractors and service men where the use of a wing cap valve is indicated.

HENRY VALVE CO.

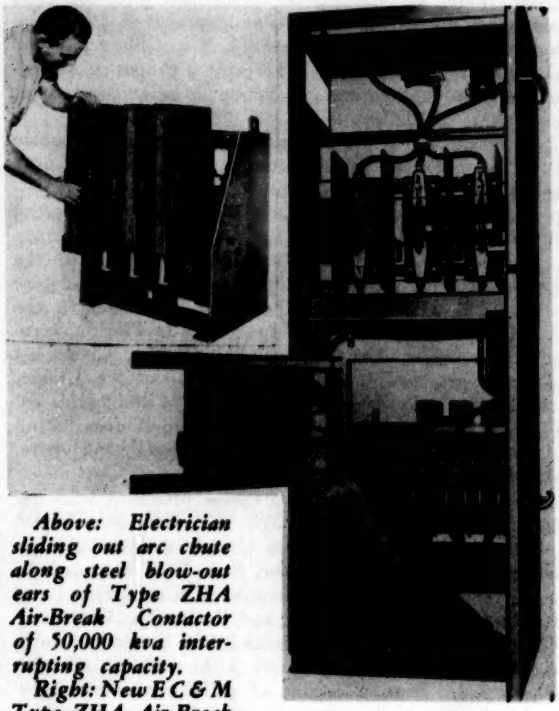
Melrose Park, Ill. (Chicago Suburb)

Cable: HEVALCO, MELROSE PARK, ILLINOIS

Valves, Driers, Strainers, Control Devices and Accessories for Refrigeration and Air Conditioning and Industrial Applications

New High Voltage Starter

A NEW line of AIR-BREAK starters for 2200-5000 volt squirrel-cage, wound-rotor and synchronous motors is announced by The Electric Controller & Mfg. Company, Cleveland, Ohio. These starters are built in three styles: 50,000 kva interrupting capacity, with power fuses for systems of 150,000 kva (2300 volt) and 250,000 kva (4600) availabliity, and in the Valimitor (volt-ampere-limitor) style in which air-core reactors limit infinite kva to a finite value within the rating of the starter.



Above: Electrician sliding out arc chute along steel blow-out ears of Type ZHA Air-Break Contactor of 50,000 kva interrupting capacity.
Right: New E C & M Type ZHA Air-Break starter for 2200-5000 volt motors, with over-load relay panel swung out and electrician holding solderless connector to which motor leads are attached.

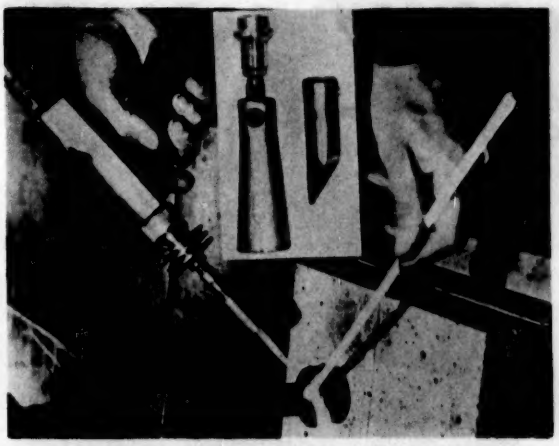
The Type ZHA air-break contactor, shown here, has an interrupting capacity of 50,000 kva. High silicon steel blow-out ears are magnetized from a single blowout coil on each pole and the arc chutes are equipped with cooling plates which remain moisture free, cooling and extinguishing the arc quickly and efficiently.

Incorporated in the complete starter are safety door-switch on the disconnect-switch compartment, swinging overload panel, self contained bus for group installation, meters as required and cabinet-doors which may be lifted off concealed-type hinges during installation. The contactor is accessible from the front and rear of the cabinet. For reversing service, forward and reverse contactors are mechanically, as well as electrically, interlocked.

Fire Gun For Soldering

THE Fire Gun, a new portable hand-operated heat tool that burns clean, low-cost propane with a heat range of 4,000 to 117,000 btu per hour, is now available for small or large heating applications that are within or beyond the capacity of conventional blow torches or soldering irons, from the Fire Gun Sales Corp. Denver, Colo. It is suited for a multitude of heat uses, such as soldering, tinning, brazing, preheating, thawing, plasticizing and paint removal.

The flame burns clean with no carbon deposit or "blackened area" because the burner tips give complete combustion of the propane using oxygen from the air. It is claimed to operate at about one-tenth the cost of an acetylene torch for the same amount of heat. Also, the propane fuel is readily available from local bottled-gas dealers.

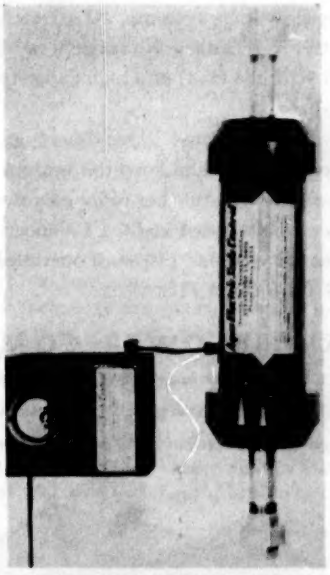


The New Portable Fire Gun

Basic fire gun kit includes a heat concentrator tip, a high heat or blow torch tip, a soldering iron tip which is equivalent to a 12 lb. commercial iron, hose, regulator, pressure gauge, and steel carrying box.

Improved Aqua Electric Scale Control Unit

RECENT improvements in design have been incorporated in all five sizes of the Aqua Electric Scale Control unit which was first introduced some nine years ago. This control is used to treat water electrically for the prevention of hard scale formation in all types of equipment which use or are cooled with water. Changes have been made in the control box for better operating efficiency. A new and more positive method of applying the electrical treatment has been developed in the cylinder and the number of required connections reduced from 4 to 2. The Aqua unit operates on 110 volts and creates a physical change in the form in which the scale forming elements precipitate. No chemicals are required and the operating cost is less than 15 cents per month, it is claimed. The new units are available in five sizes ranging from ¾ to 4 inches with treating capacity from 18 to 450 gpm.



Improved Aqua Electric Scale Control Unit

400 TONS CAPACITY

PATENTED DUO-PASS and OILOUT

Aeropass CONDENSER

U. S. Patent Reissue No. 21,917; 22,533

YOU USE LESS POWER...

SAVE CONDENSER WATER...

SAVE UPKEEP COST

For large refrigeration systems, NIAGARA gives you a choice between a battery of condensers (that may be cut on or off with the load) or a high capacity condenser that saves space.

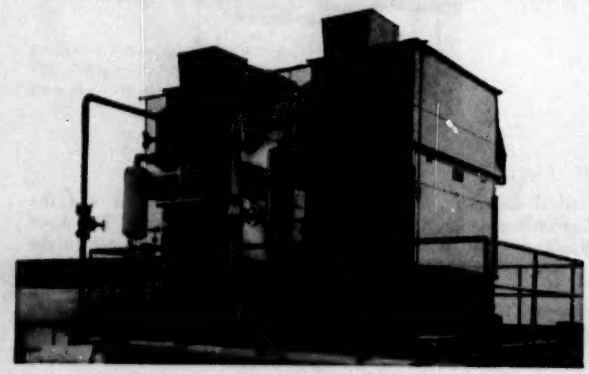
Both have the patented "Duo-Pass" and "Oilout" that remove superheat and keep the system free of oil. Results: you save one-third or more of power cost and upkeep expense. Niagara Patented Balanced Wet Bulb Control gives lowest head pressure operation automatically. *Write for Bulletin 111.*

NIAGARA BLOWER COMPANY

Over 35 Years Service in Industrial Air Engineering

Dept. IR, 405 Lexington Ave. New York 17, N. Y.

Field Engineers in Principal Cities of U. S. and Canada



PRESS BRIEFS

Foremost Dairies Continues Expansion

FOREMOST Dairies Inc. has plans to acquire full ownership of the Philadelphia Dairy Products Company, Paul E. Reinhold, Foremost chairman and Grover D. Turnbow, Foremost president have announced. The company has agreed to acquire 65,000 to 70,000 additional shares of Philadelphia to increase its holdings to about 66 percent of all outstanding shares. It is also agreed that promptly after April 1, it will file a registration statement with the SEC covering a proposed offering of five shares of Foremost common to be exchanged for each share of Philadelphia.

Foremost also has concluded an agreement to acquire Blue Moon Foods, Inc., through exchange of 2/5 of a share of Foremost common plus $6.00 par value in 4½ percent $50 par Foremost preferred for each share of Blue Moon common.

Acquisition of Philadelphia Dairies is in line with the Foremost policy to establish itself in areas not heretofore served and will round out Foremost operations in the Atlantic Coast States from Connecticut to Florida, company executives said. Philadelphia Dairies, whose list of dairy products includes Dolly Madison Ice Cream, operates from Westchester County, N.Y. to Richmond, Va. The company has 12 processing plants and 22 distributing plants located in New York, New Jersey, Pennsylvania, Maryland, Delaware and Virginia.

Blue Moon Foods, Inc., is a cheese processor with national distribution and through its wholly-owned subsidiary, June Dairy Products Co., is a distributor of butter, eggs and cheese in the New York metropolitan and Miami areas, with warehouses in Miami, Fla., Long Branch and Jersey City, N.J. and Bridgeport, Conn.

Inclusion of the two companies in the Foremost family will add sales of approximately $100 million annually, will extend Foremost's scope of activity as one of the world's largest dairy enterprises into new and important territories, as well as new segments of the dairy industry and will increase Foremost's gross sales to an annual rate in excess of $400 million.

Russell Creameries Beatrice Foods Merger

CONTRACTS have been completed for a merger between Beatrice Foods Co. and Russell Creameries, dairy and ice cream manufacturing company with plants and distribution in northern Wisconsin and northern Minnesota. The company operates milk and ice cream plants in Superior, Wisconsin with branches at Milaca and Hinckley, Minnesota, and ice cream plants in Brainerd, Bemidji and Fergus Falls, Minnesota.

Russell Creameries was founded 57 years ago in Superior by Charles Russell, father of the present owners and general managers. Throughout this entire period the company has maintained a fine reputation for quality in both milk and ice cream.

The company distributes its products over a wide area in northern Wisconsin and northern Minnesota, extending in Minnesota to International Falls and the Canadian boundary on the north, to the North Dakota boundary on the West and the Wisconsin boundary on the East.

The company will be operated under the same management and sales personnel as in the past. No change will be made in the brand name or method of operation. Frank Russell will continue as general manager of operations at Brainerd, Bemidji and Fergus Falls, Minnesota, and Ray Russell as general manager of operations at Superior, Wisconsin and Milaca and Hinckley, Minnesota.

Merchants Announces New Warehouse

PLANS for the construction of a modern refrigerated warehouse in Vinita Park, St. Louis, Mo., have been announced by the Merchants Refrigerating Co., New York City. The one-story warehouse, approximately 520 ft. by 240 ft. and costing in excess of $1,000,000, will be erected on a 27-acre tract on the north side of Page Boulevard west of North and South Road.

This building is the first unit to be constructed on this property. The site is being developed for several additional units to be built at later dates. The Merchants Refrigerating Co. owns and operates nine other refrigerated warehouses in New York City and Buffalo, N. Y.; Jersey City and Newark, N. J.; Hopkins, Minn., Modesto, Calif., and St. Louis, Mo. The new warehouse will supplement the downtown St. Louis operation at Lewis and O'Fallon streets.

The new structure will contain more than one million cubic feet of refrigerated space, providing both freezer and cooler temperatures, and will be completely palletized and mechanized. Blast freezing at 40 to 60 degrees below zero for quick freezing of perishable foods will be available.

Ample and modern truck docks equipped with electric outlets for connection of refrigerated trucks arriving at night are being planned and a large parking and turning area will be provided.

Office space will be available for tenants requiring offices adjoining refrigerated space for distribution of frozen foods.

McGraw Electric Buys Coolerator

THE COOLERATOR Division of International Telephone & Telegraph Corporation has been purchased by The McGraw Electric Company for an undisclosed price. McGraw makes a variety of heavy electrical equipment and home appliances. Coolerator was acquired by I.T. & T. from the Gibson Refrigerator Company in 1951. The division was sold, according to an I.T. & T. spokesman because it has been losing money.

The sale involved only the current inventory of refrigerators and freezers, all machinery and fixtures and the Coolerator name. McGraw did not buy the two Coolerator plants in Duluth, but an option to buy was taken. The plants now are closed.

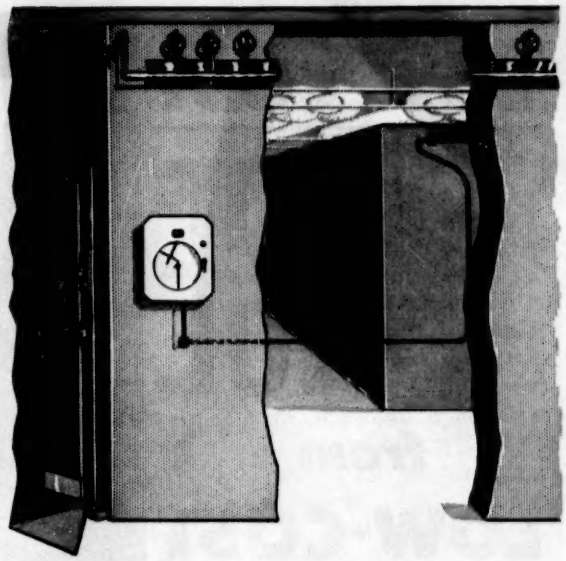
The joint announcement said: "A property sale may result if excessive costs and taxes at Duluth can be adjusted. McGraw's plans for manufacturing either in Duluth or elsewhere will be announced shortly.

Room Air Conditioner Shipments Increase

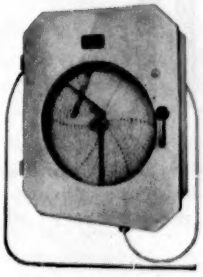
AN INCREASE of 25.2 percent in shipments of room air-conditioners by manufacturers during the first nine months of 1954 over the first nine months of 1953 has been announced by Geo. S. Jones, Jr., managing director of the Air-Conditioning and Refrigeration Institute of Washington, D. C. Over a million units (about 1,177,100) were shipped by manufacturers during the first nine months of 1954, compared with 940,310 units shipped during the same period of 1953.

Texas Ice Plant Sold

THE City Ice Company and the ice plant of Central Louisiana Electric Company have been sold to H. C. Hopkins, C. F. Young and H. Newton Hopkins. H. Newton Hopkins will be managing partner and a local manager will be appointed. Mr. Young is from Beaumont and the Hopkins are from Silsbee, Texas, where they operate ice plants. The City plant will be closed for about a month while repairs and remodeling will be effected.



Witness for the PROTECTION . . .



FOR your protection . . . and the protection of your customers' food. The Taylor Locker Room Thermometer gives you an accurate, continuous permanent record of the temperature inside your locker room—from a convenient point outside the room.

Here is irrefutable evidence for you, in case of damage claims; and assurance for your customers that their foods are being kept safely.

Taylor's exclusive Accuratus tubing allows the instrument to be placed as far as 100 ft. away from the highly sensitive temperature bulb, unaffected by the varying temperatures through which the tubing passes. The case is moisture proof and corrosion resistant. 12" charts, graduated in degrees and hours, can be changed in seconds.

Ask your Taylor Field Engineer, or write for **Catalog 300.** Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada.

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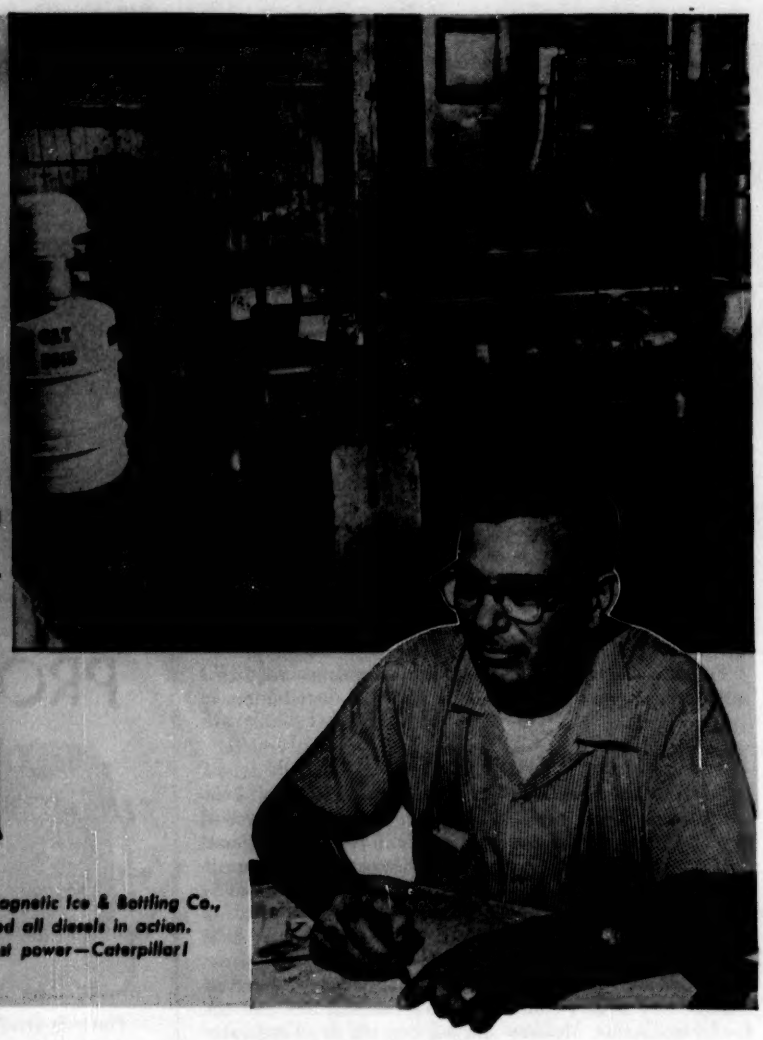
ACCURACY FIRST

IN HOME AND INDUSTRY

LOW-COST ICE from LOW-COST POWER



C. L. Smith, manager of the Magnetic Ice & Bottling Co., Lebanon, Missouri, has observed all diesels in action. His choice for reliable, low-cost power—Caterpillar!

Magnetic Ice & Bottling Co., Lebanon, Missouri, uses a Cat* D315 Engine to power its 7½ x 7½, 30-ton compressor, which has the capacity of producing 21 tons of ice in a 24-hour day and refrigerating a 12′ x 16′ cold storage room. The engine works 16 hours a day, every day, four months a year. Manager C. L. Smith says: "We installed it because electric operation would cost about $600 a month. Also, in my former job as bulk agent for an oil company, I had the opportunity to observe all diesels in action. In my opinion, Cat is the most reliable."

On-the-job records, in plant after plant, back that opinion with facts. They show that Caterpillar Diesel Engines work at *minimum* cost with *minimum* maintenance — *for years*. Take fuel costs, for instance. You can save substantial sums using this thrifty diesel. It operates on low-cost No. 2 furnace oil without fouling to give you three-way savings — less fuel, cheaper fuel and rock-bottom maintenance. It doesn't require the attention of a skilled worker — another saving. And it's ruggedly built to deliver trouble-free performance day after day. If you should need service, you can count on it *fast* from your nearby Caterpillar Dealer.

Get the complete facts on these money-saving units from him. He'll be glad to refer you to other plants using them, so you can check on their performance firsthand. Engines and electric sets are available in 12 sizes up to 500 HP and 315 KW. There's Caterpillar power *just right* for your plant!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

"Both Cat and Caterpillar are registered trademarks—®

USE CAT POWER FOR MONEY-MAKING PRODUCTION

In the Spotlight

INSURANCE is one of the items of expense that beset the managers of all business concerns, large and small. The subject is broad and complex and the answer as to the types and amount that should be carried resolves itself very largely into a determination of individual needs. The problem is discussed from the point of view of the executive, pointing out the major objectives to be achieved, the pitfalls to be avoided, and the various types of potential losses that are insurable. The article starts on page 13.

A LARGE refrigerated warehouse center is being built on Chicago's south side by the Calumet Industrial District at a cost of $25 million. It will include twelve warehouse buildings located along a mile-long tract, with rail, water and truck facilities. For additional details, see illustrated article on page 24.

ICE VENDING provides the means for a profitable and increasing ice business, says an ice man with many years of experience. He presents in the article on page 26 a complete guide on how to run such a business. Based on his experience he says the rate of increased sales forecasts a boom in ice. All ice men, whether vending ice now or only considering it, will find this article packed with valuable practical information.

THE REFRIGERATED Warehouse Industry expects to have over 480 million cubic feet of refrigerated space in operation by the end of 1955. This compares with 389,991,000 cubic feet of space operated in 1943, about the time the frozen food boom started to pick up momentum. Over half of the 480 million cubic feet will be freezer space for frozen foods.

A NEW Environmental Test Laboratory has been constructed by the Sperry Gyroscope Company for subjecting electronic equipment to varying conditions of atmospheric pressure, temperature, humidity, shock, vibration, corrosion, and contamination from sand, dust and salt. A view of four of the fourteen Frick Condensing units is shown in the cover picture and story of the installation is on page 50.

A TRAINING conference for warehouse personnel to review and bring up to date recent technical developments and new operating techniques was held at the Edgewater Beach Hotel, Chicago, the week of January 10. Emphasis was placed on problems that are new and pressing in this present era of expanding volume of frozen foods and other perishable food products. Report of the conference starts on page 45.

UP-GRADING of eggs received by commercial refrigerated warehouses for storage is charged in a Chicago newspaper, resulting from lack of standardization and variation of egg samples. Chicago warehouseman denies any collusion on part of federal inspectors. For details see story on page 50.

OLD TIMERS in the heavier refrigeration industries show no fear of NH_3 handling with regard to fire or explosive hazards. Experience has developed in them a healthy respect for employing proper safeguards. Familiarity however, lessens respect for the real hazard, toxicity. In "How Dangerous is Ammonia?," Ken Holaday, Anheuser-Busch, Inc. reviews the facts concerning this practical refrigerant. See article on page 31.

CHICKEN FLAVOR is diminished when the raw bird is soaked in cold water, according to Agricultural Research Service chemists. Since chilling in slush ice and thawing in cold water are common, the point is important to industry. Chicken research also determined alluring flavor comes from the meat, while bone and skin yield minor amounts, fat almost none.

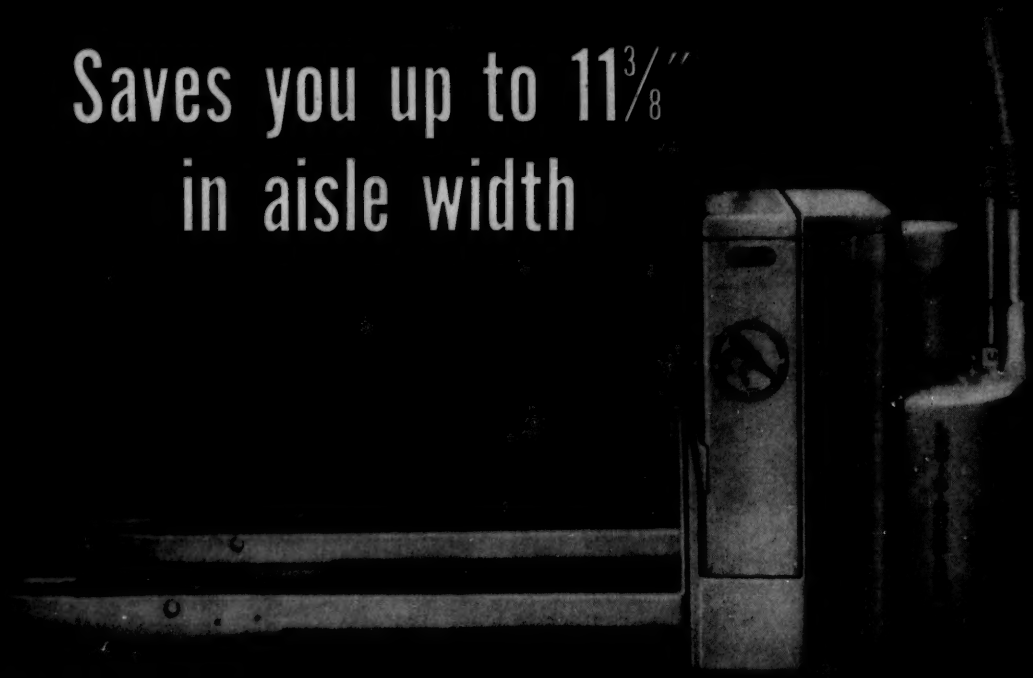
CENSUS BUREAU data show that by 1975 the United States will have 200 to 220 million people. A social security study predicts 250 to 260 million by the year 2,000. USDA estimates that food needs will go up in slightly greater proportion if we continue to improve diets (with more proteins, minerals, vitamins, etc.). Undoubtedly refrigeration has had a part — particularly in improved diet, and it will have a more important part in the future.—TRRF Information Bulletin.

ABOUT FIFTEEN percent of the American homes with electricity have home freezers, while 90 percent of them have electric refrigerators. There are around 6,500,000 home freezers in use in the nation, compared with only 160,000 in 1946.

THE STATE of Iowa leads all others in the number of meat animals per square mile. The "corn" state averages 290.2 cattle, hogs, sheep and lambs per square mile.

THREE out of Four American working people are not members of unions. Of 64 million persons comprising America's work force 16 million belong to unions.

Saves you up to 11 3/8" in aisle width



A Master TRUCK

The *ALL-NEW* L-S Electric Pallet Truck for 3-ton loads

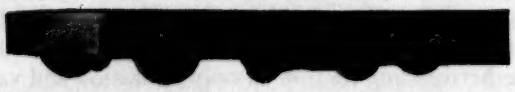
Now you can achieve significant savings in costly aisle space with the all-new Lewis-Shepard JackLift Electric Pallet Truck. This new "walkie" offers the shortest headroom (25⅞") of any standard pallet truck . . . handles 48" long pallet loads in aisles only 6 feet wide. And the new JackLift is packed with power . . . handles loads weighing as much as 6000 lbs.

Here are a few of the other standout features of the new L-S JackLift Electric.

- **Exclusive** L-S handle-head controls — traction speeds and brake, forward-reverse, lift and lower, horn and key switch are within finger tip reach.
- **Exclusive** L-S safety braking—brake is on Speed-controller . . . truck operates with handle in any position including vertical.
- **Exclusive** L-S booster rollers — truck rolls into empty or loaded pallets with equal ease . . . eliminates damage to pallet loads.

SEND FOR THE FACTS about the space-saving new L-S JackLift TODAY! Mail the coupon. ▶

COMPARE CONTROLS for convenience, safety. All L-S JackLift controls are in handle-head. Brake operates with handle in any position, including vertical.



COMPARE EASE of pallet entry. L-S JackLift has 5 booster rollers . . . enters pallets smoothly, easily!

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Please send Catalog 35C on New L-S JackLift Electric

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Are You Covered?

MAX K. DOEHLER, JR.,
Asst. Mgr. Bruce Dodson and Co.
Kansas City, Missouri

How to Buy the Types of Insurance to Provide Protection for Refrigerating Plants

This fire involved a total loss to three ice storage buildings separated by fire walls. Fire started on frame loading dock and entered loading door of one building from which it burned through insulation to the roof and finally consumed insulation of the three buildings.

Max K. Doehler, Jr. Bruce Dodson & Co.

DAILY TOLL of disastrous fires, explosions, hurricanes, serious automobile accidents and injuries to workmen eat up fixed assets, plus past and future earnings at the rate of almost 12½ million dollars a day.

Fire damage alone ran nearly three million dollars a day in 1953. The industry could buy thirty ice or cold storage plants worth one hundred thousand dollars each, every day in the year with this money.

The daily cost of medical and compensation payments to injured workmen probably exceeds the daily payroll of all refrigerated products plants in the entire United States. Automobile accidents cost nearly 6½ million dollars each day. The sum total of all these insurable risks can easily cause the loss of a business that has taken many years to build. It is important for a plant owner to know what these risks are, the types of insurance available and how to buy the protection at a reasonable cost.

What A Disaster Can Do

Most individuals always feel that accidents happen to the other fellow. Without proper insurance, a disaster may mean the loss of a year's profit or the loss of an entire business if not insured or inadequately insured. A property owner can avoid such a loss by using insurance to spread and lessen these otherwise devastating shocks. All business involves taking some risk. Some an owner must bear himself, like making a success of his business. Others can be insured against and thus substitute a known premium for an unknown cost.

American industry has become complex. There are tremendous investments in plants, machinery and equipment. Sales and distribution involve relationships with customers and other business houses. Large corporations now employ full time insurance buyers to analyze their various insurable risks, design an insurance program and buy the necessary protection within a financial budget. The average refrigeration plant can't afford, and doesn't need an insurance manager. An owner should know whether the firm carries the right kind of insurance and if it is being purchased properly.

A business concern could spend all its profits if it were to buy every type of insurance available. Owners of refrigeration plants have often remarked that they'd go broke if the

This disastrous fire in a large ice storage building occurred when lack of openings and equipment suitable for fighting the fire from the roof made it necessary to let it burn itself out. It was never extinguished.

firm bought all the types of insurance that some insurance man tried to sell them. This is true. However, when asked how they determined what types of insurance to carry or what rule they use to determine what insurance is needed, few seem to have a method to guide them.

How to Determine Insurance Coverage Needed

Let's consider the "large loss theory", a flexible rule that both large and small plants alike can use. This gets you down to the question of what is a disaster to the individual plant. To a small plant a $100 loss could be a financial shock. On the other hand, there are large refrigerated products plants that could absorb a $10,000 loss without serious damage to earnings or accumulated surplus.

The rule then in selecting insurance is to buy those types of insurance which cover a loss that, should it occur without insurance, would seriously affect either the firm's earnings or impair its surplus.

An example: Many firms carry plate glass breakage insurance to cover a possible loss that may not exceed $100, and yet fail to carry Public Liability Insurance to cover a loss of $100,000 should someone other than an employee be injured in or around the plant or ice vending station. It is easy to see then how lack of insurance to cover a personal injury loss could cost the businessman his entire plant investment.

Major disasters provide a clue to the most important types of insurance. There was the Texas City disaster. It was due to an explosion. The damage exceeded 100 million dollars. In 1953, tornadoes ripped through many metropolitan areas of the United States: Worcester, Massachusetts, sustained a loss estimated at 55 million; Waco, Texas, sustained a loss estimated at 20 million; Vicksburg, Mississippi, suffered over 10 million in losses. These storms caused injuries and death to many. On August 31, 1954 the hurricane "Carol" did an estimated one-half billion dollars damage to the New England states, and the hurricane "Hazel" more than duplicated that destruction.

Effect of Severe Losses

Coverage criteria is not entirely on frequency of loss; rather the basis is loss severity. Insurance rates generally reflect the frequency with which losses occur. Naturally where there are many losses such insurance carries a higher rate than a type of insurance where losses are infrequent, such as earthquake protection in places not often suffering quake damage. In the city of Charleston, South Carolina, there has been no serious earthquake since 1886. At that time 6,854 buildings were damaged; 102 were condemned and had to be torn down. Therefore, the rate on earthquake insurance is low in Charlestown, South Carolina. It is doubtful that many refrigerated products plants outside the Pacific Coast area carry it, but if an earthquake did happen it would do just as serious damage to an individual plant as if it were a daily occurrence.

Major types of insurance are those forms which past experience indicate are necessary if a firm is to realize the maximum consistent profit out of business without subjecting itself to loss of that profit.

Three major aspects of an insurance problem are: (1) the types of insurance which should be carried and how to buy it properly as to protection and cost; (2) how to select an insurance company and determine its financial strength; and (3) how to select an insurance counselor who understands the firm's needs.

Selecting Insurance

To operate, a company needs a plant, machinery and equipment to produce ice, refrigeration or cold storage facilities. Furthermore, the only reason for being in business is to earn a profit, and that means that if a business is worth establishing it is worth protecting.

Protecting physical assets is sound business practice, and most ice and cold storage plants do carry such insurance. Few, however, cover loss of earnings or extra expense caused when a fire forces a plant to shut down. The cost of earnings insurance is usually at a much lower rate than charged for building insurance. Contingent Business Interruption Insurance is needed where interruption of public utility services can cause a shutdown even though the plant suffers no direct damage.

No Plant Immune From Loss

Many times plant owners have indicated that their plants can't burn, wind will never strike them, nor explosion blast them to pieces; but year in and year out since 1900, properties have been completely destroyed by such perils. It is wishful thinking to believe that losses always happen to the other fellow. In Arizona, an employee of an ice plant was welding a trailer hitch to the bumper of a car. The car's gas tank caught fire and spread to the plant. The fire department arrived in 35 seconds, but the entire tank room was already ablaze. The loss amounted to $80,000.

In Arkansas $70,000 damage was done to a brick building when defective wiring caused a fire in the ceiling wood shavings insulation. The blaze spread to the tank and engine rooms. A loss of $29,905 was suffered in a California cold storage plant caused by explosion and fire due to a bursting light bulb igniting ammonia fumes. Last year, windstorms took their toll with a brick plant in Texas being damaged to the extent of $58,547 and a plant in Massachusetts damaged to the extent of $29,373.

From these examples can be seen the importance of carrying Fire, Lightning, Windstorm, Hail, Explosion, Riot, Damage from Falling Aircraft and Vehicles, as well as Smoke Damage and Vandalism and Malicious Mischief.

Should a plant be protected with automatic sprinklers, then at least on machinery, equipment, and stock should be carried some Sprinkler Leakage protection. Water will do just as much damage if accidentally discharged from a sprinkler system as if set off by a fire on the premises. In those areas that show serious earth faults even though no previous earthquake has occurred, this type of coverage should be carried because it could devastate the plant.

Prompt action in removing customers' goods from the locker section of this plant, while the fire was in progress, prevented a possible $8,000 loss due to spoilage for lack of refrigeration. This locker section was not damaged but the contents would have been lost had not all customers been notified to remove their goods promptly.

Important Points to Watch

Unfortunately, the so-called Standard Fire Insurance Policy is a misnomer. It is true that its provisions are standard. Insofar as each individual plant is concerned the policy must be tailor-made to fit the problems of ownership of each plant. The need for properly drawn forms is apparent. Also if owners want insurance to pay the firm in full without deduction from its loss, have the Replacement Value Clause included and collect the building and machinery loss in full.

Many firms base their insurance on values as carried in their books of account. Generally such values are so far from the true insurable value as to create a serious deficiency should a plant owner attempt to base insurance on them. Examples of losses suffered as a result of using such values or under-insurance are listed in Table 1. Using the year 1913 as a basis, Table 2 will indicate how construction costs have varied during the past 40 years.

If a building constructed in 1945 were to be replaced today the cost would be 100 percent more than it was then. The subject of proper determination of insurable values is important not only from the standpoint of carrying a sufficient sum of insurance to replace the plant in the event it is destroyed, but also to comply with the coinsurance clause which is so often a part of fire and other types of property insurance.

Coinsurance Clause

The coinsurance clause is sometimes misunderstood. Here is how it operates:

What does the coinsurance clause do? It offers a substantial savings in cost. For example, in outstate Illinois a 25 percent reduction in rate is given for fire insurance on a brick building under proper fire protection, if the 80 percent clause is used; or if a broader form is used, such as blanket form coverage which requires a minimum of 80 percent insurance to value. (In some sections of the country there is no option on the part of the buyer as all rates are based on the use of at least 80 percent coinsurance.)

What happens in the event the insured suffers a loss, if the insured complied with the clause — the clause requiring the insured to carry a required percentage of insurance to value? Nothing is required financially of the insured. The loss suffered is paid in full not exceeding the sum of insurance carried.

What happens if the loss equals or exceeds the agreed percent of insurable value? Should the insured suffer a loss that is more than the agreed percent of insurance to value, the insured firm would collect the full amount of insurance. The coinsurance clause only operates when both the amount of insurance carried and amount of loss are below the agreed percentage.

When does the clause apply? If the insured hasn't carried all the insurance agreed to, then the insured firm would become a coinsurer and pay a pro rata share of its own loss. Table 3 shows how the clause works if a policy had the 80 percent coinsurance clause in it, and owner carried less insurance than agreed to.

In the table the insurance buyer agreed to carry 80% insurance to value at the time of the loss, but had actually only carried 70% or $7,000. Since $7,000 subtracted from $8,000 leaves $1,000, the insurance agreed upon is $1,000 short. The insurance buyer then acts as an insurance company and pays a share of the loss for the amount he is short, which in this instance is $1,000 or 1/8th of the total insurance. Therefore, the buyer stands 1/8th of the loss of $5,000, which means the owner contributes $625 and the insurance company 7/8th or $4,375.

This example illustrates why it is important that insurable values be determined properly and kept up to date. There are insurance companies serving the industrial refrigeration industry that give valuation service to help owners determine the right amount of insurance to carry.

TABLE 1 — LOSSES DUE TO USE OF BOOK RATHER THAN TRUE INSURABLE VALUES.

	Total Loss	Total Insurance	Loss Above Insurance
Cairo, Georgia	$ 30,393	$25,443	$ 4,950
Trenton, New Jersey	105,110	40,613	64,497
North Carolina	18,395	9,853	8,542
Joliet, Illinois	25,259	17,792	7,467

TABLE 2 — CONSTRUCTION COST COMPARISON — 1913/1953

Year	Cost Index	Replacement Cost in Year Indicated Below
1913	100%	$10,000 Building in 1913
1923	215%	$21,500 ..... up $11,500 from 1913
1933	145%	$14,500 ..... up $ 4,500 from 1913
1943	250%	$25,000 ..... up $15,000 from 1913
1953	582%	$58,200 ..... up $48,200 from 1913

TABLE 3 — EXAMPLE OF COINSURANCE FUNCTION

Property Value	Insurance In Force	Loss	Insurance Pays	Owners Contribution
$10,000	$7,000	$5,000	$4,375	$625

80 percent value is $8,000. Insurance being $1,000 less, owner is therefore made a coinsurer and contributes proportionately.

Insurance ($7,000) pays 7/8ths of loss $4,375
Owner Contributes 1/8 625

Amount of Loss 5,000

Insurance is constantly changing just as changes or improvements are taking place in the machinery and equipment offered the industry. It is now possible to include free of charge the cost of removing debris caused by an insured loss. The so-called liberalization clause can be added without charge. It automatically modifies the insured's policy to include all broadening of insurance coverage, whenever such added protection is made by the company without additional premium charge. Be sure where there are more than one company carrying the insurance, that all forms covering the same property read alike to avoid delayed and unsatisfactory loss settlements.

Reducing Fire Rates

Following are penalty rates applicable to premiums on fire insurance for ice and cold storage plants. Careful attention to construction details and plant maintenance affords the insured opportunities to reduce fire rates. Figures are per each $100 coverage.

1. Ammonia Drums — When more than two full ammonia drums (excluding one attached to system) are kept in the plant, a charge of from 2c to 12c can be made.

2. Metal Smokestacks — If clearance to combustible material is less than 18 inches, rate penalty varies from 7 to 18 cents. Non-standard breaching clearance where it is less than 36 inches from combustible material inflicts a charge of from 7 to 10 cents.

3. Non-Standard Clearance — Non-Standard exhaust pipe clearances can cause a charge of from 1c to 50c on masonry buildings, and 5 cents to $1.00 on frame buildings when the exhaust pipe does not have full 9 inch clearance to combustible material. The same charges apply when the muffler does not have a clearance of full 12 inches to combustible material. All exhaust pipes passing through the roof should continue for a distance of at least 10 feet above the building and should also be 10 feet from any opening in the wall. They should be equipped with a spark arrestor if the roof is of a combustible nature.

4. Truck Storage — If garage section isn't cut off as a separate fire division and garages more than three trucks, it can inflict a penalty over the entire plant of from 6 to 45 cents.

5. Miscellaneous Charges — Table 4 lists other common items which involve penalties.

In all the figures given the charge varies according to construction, size, and public fire protection. The insured's insurance man should be given instructions to secure and review the rate makeup of the plant. He should advise of all removable charges and what they cost the insured, in order that it can be decided whether the cost to eliminate the charges is worth the savings.

Other Savings Available

Owners often overlook other savings in rates. Check the following suggestions:

1. New Buildings — Owners are entitled to free service by the local fire insurance rating bureau. They will gladly review your building or alteration plans to make sure you enjoy the lowest possible rate by keeping the fire hazard to a minimum.

2. Insure for Longer Than One Year — A three year policy costs 16 2/3% less than one year, and a five year policy means a 20% savings. These premiums must be paid in advance.

3. Installment Plans — Where you buy three and five year policies and pay in annual installments you can save on premiums after the first year as generally the remaining yearly installments are 80% of the regular annual premium.

4. Properly Designed Forms — A skilled insurance man can develop a form for the particular plant that will give the owner the greatest possible savings in cost by properly allocating items insurable with the building to that item. For example; all stationary refrigerating apparatus, such as tanks and their insulation, compressors, condensers, lockers, cooling towers, engines, hoists and other machinery can be insured with the building at the lower rate applying thereto. Latest improvements authorized by the Insurance Rating Bureau of the insured's state should be included in the form.

5. Good Housekeeping — Preventing a fire means saving because no matter how much insurance an owner has, a bad fire doesn't make money for anyone. Keep the plant clean both inside and out. It cannot be stressed too strongly the necessity of preventing fires where it is within the control of the plant owner to eliminate a hazard. For example; one insurance firm paid a loss of $20,500 where sparks from a locomotive set fire to weeds surrounding the plant. Be sure to keep weeds cut. Caution employees about care in burning trash.

Compulsory Insurance

All forty-eight states have laws that make it necessary for an employer to provide benefits to injured workmen in the event they suffer accidental injuries, and most states also require coverage of occupational disease. Generally these laws give the employer an option to satisfy the requirement by either carrying insurance, posting a surety bond, cash, or qualifying as a self-insurer. Insurance is carried by most refrigerated products plants. It is suggested that the following aspects of compensation insurance be checked:

1. Occupational Disease — An owner located in a state wherein occupational diseases do not automatically come within the scope of the law can elect to bring such coverage

TABLE 4 — PENALTIES IN PREMIUM RATES FOR FIRE INSURANCE DUE TO SUBSTANDARD CONSTRUCTION, ETC. CREDITS FOR PROTECTION ITEMS.

Items of Risk	Penalties
Unprotected floor opening (Stairs & Elevators)	1c to 4c
Frame Additions to masonry plants	5c to 30c
Hollow block additions to masonry plants	2c to 20c
Garage sections with wood floors	2c to 32c
Gasoline or Diesel engines used as standby units	2c to 12c
Protection Items	**Credits**
Installation of required metal waste can	5c
Standard quota of fire extinguishers	2c to 8c

within the liability section of the firm's Workmen's Compensation Policy.

2. Longshoremen's Liability — If a firm has driver-salesmen delivering aboard ship, coverage under the Longshoremen's and Harbor Workers' Compensation Act should be added.

3. Extra Medical — Most Workmen's Compensation Laws limit the amount of medical payment that is available for an injured employee. Many employers prefer to go beyond this statutory requirement and provide extra legal medical coverage up to as much as $10,000 per accident.

4. Waiver Subrogation Right — Should an insured sign a hold-harmless agreement in connection with vending machines or other operations, be sure to notify the insurance company. A firm may be called upon to pay its own loss where the insurance carrier settles with an employee, and then takes its subrogation rights against the wrongdoer only to find the insured has waived this right without the company's consent.

Cost Reduction Factors of Compensation Coverage

Certain benefits and liabilities accrue to owners covered by compensation insurance. Some of the following factors have cost reduction effects:

1. Ice Manufacturers' Rate Classification — This rate classification includes vending machine installation and sign erection. However, in auditing Workmen's Compensation Policies it has been noted that some companies have included separate rates for vending machine installation and sign erection. This is incorrect. They are included in the ice manufacturing classification rate.

2. Independent Contractors — If the insured employs contractors or subcontractors, most Workmen's Compensation laws make the insured responsible for injuries suffered by the employees of said contractors unless they carry their own insurance and the insured receives a certificate to that effect.

3. Loss and Expense Constants — If an owner pays more than $500 a year for Workmen's Compensation Insurance, the charge for the loss and expense constant should be eliminated. Check the final premium billing to make sure that this charge isn't included.

4. Overtime and Maximum Pay — If an owner keeps payroll records properly there is no charge for the overtime portion of your payroll, and there is a weekly limit of $100 for any one employee.

5. Premiums over $1,000 — If an insured's premium exceeds $1,000 a year, there are several options that will reduce final cost; such as the premium discount plan, or retrospective plans, A, B, C, or D. The plan selected should be based on the firm's past loss experience, and its interest and efforts to control losses through safety measures installed by the firm and its insurance company.

6. Experience Rating Plans — Not least is the experience rating plan which applies to refrigerated products plants in most states where owner pays from $300 to $500 in premiums per year. Experience rating offers an opportunity to either lower insurance cost substantially if the insured does a good job in loss prevention; or increases the cost if the firm is lax in employee selection, training and plant safety practices.

Some ice manufacturers have missed an opportunity to save on experience ratings because they were unable to keep good employees. Wages weren't competitive with what other industries in the area paid. And, there has been a considerable lack of interest in safety engineering.

Even if a plant is too small to qualify for experience rating, safety measures should be taken. Basic rates for ice and cold storage plants are determined by the loss experience of the industry in a given state. National Safety Council figures show the highest accident record occurs in plants employing less than twenty-five. Proper employee selection and training is important to eliminating the accident-prone employee before he gets on the payroll. From good business point of view, it also reduces costly personnel turnover: It's said that 88% of all accidents are due to human failure.

How important is good personnel selection? A Nebraska driver was involved in a serious intersection collision. When insurance claims attorney investigated the driver's record it was learned that he had been arrested 24 times in seven years. Seventeen arrests were for being drunk, five were traffic violations, and two were of a miscellaneous nature. Such a driver should never have been allowed to get behind the wheel of a truck. Now the employer is paying an increased rate on his Automobile Insurance because proper employment selection procedures were not used.

7. Loss Prevention — Each year thousands of dollars "go down the drain" due to accidents that could have been prevented with proper safety and employment measures. Typical examples:

In Texas, a new employee was cleaning the floors. He used a mixture of gasoline and water. The gas fumes were ignited by a hot water heater. The resulting fire and explosion caused the death of the employee. Cost, $7,087.

In California, the chief engineer of an ice plant stepped backwards off a five foot platform. He suffered a bad back injury. The final cost of this claim is not yet determined, but is estimated at about $7,000. Proper guard rails could have prevented this injury.

8. Premium Pay Plans — If the insured's yearly premium is large enough, it is possible to pay the premium in monthly, quarterly or semi-annual installments, at no added cost.

Automobile Insurance

Automobile Insurance is probably more universally carried than any other protection, but there are opportunities to reduce the cost or improve protection. It pays to review the firm's Automobile Insurance in the light of these facts each time protection is renewed:

1. Financial Responsibility Laws — All the forty-eight states have laws requiring those who drive, or for whom automobiles are operated, to pay for damages caused by such operation, or lose the right to drive. Therefore, Automobile Liability Insurance is semi-compulsory, although a businessman can use other means of complying with such laws.

2. Complete Liability Protection Needed — Automobile Liability Insurance should apply not only to the vehicles owned, but any hired as well as any non-owned vehicles that employees might use in furthering business interests. The advantages of carrying Comprehensive Automobile Liability insurance are many in that it provides automatic insurance against almost any liability exposure due to the operation of such vehicles in business.

3. Loss to Owners' Equipment — In addition to liability for personal injuries and damage to the other fellow's property, owners want to protect their own property against loss and destruction. Most ice manufacturers insure against all risks of loss or damage. Collision or Upset is usually insured on a deductible plan.

4. How to Reduce the Cost — There are many things which can reduce the cost of Automobile Insurance:

(a) Fleet and Experience Rating. A firm with more than five vehicles can generally obtain a fleet credit. If the insured's loss experience is below average, additional credits can

be enjoyed. Safety can pay off in many ways besides reducing Automobile Insurance cost. No one has ever made any money out of an automobile accident. Many authorities estimate that for every dollar of insurance money collected, there are hidthat the plant owner has to pay out den costs of as much as four dollars of earnings.

(b) Deductible Property Damage — Local delivery usually involves minor property damage claims. Some plant owners prefer to handle such losses themselves and buy Automobile Property Damage Insurance on a $50.00 Deductible basis. This results in a 30 percent credit in rate.

(c) Advertising Trucks Special Rate — Basically, ice trucks are rated as Class 5 for Liability Insurance. A vehicle used as an advertising truck and not used for delivery purposes, with a load capacity of 1500 pounds or under is rated Class 6, resulting in a savings in cost.

(d) Easy Pay Plan — In most states there are convenient premium payment plans available without a finance charge, such as the following:

Monthly — requires a deposit of 19 percent of the annual premium or at least $200, with the balance paid in monthly installments.

Quarterly — requires down payment of 35 percent or a minimum of $200, and the balance payable quarterly.

Semi-Annual — requires down payment of 60 percent or a minimum of $200, and the balance payable at the end of the first six months of coverage.

General Liability Insurance

In addition to automobiles, there are other liabilities that arise in business relations, which can be covered by several forms, or lumped into comprehensive general liability:

1. Plant Liability Insurance — Most industrial ice and cold storage plants have members of the public in or around the premises, including the dock area and vending stations. Advertising signs and vending machines in the trade area can injure someone or his property. As an example, in Pennsylvania, suit for $25,000 was filed when a woman suffered a fall caused by a driver-salesman opening a sidewalk elevator door without checking to see if anyone was walking across the door at the time he opened it.

2. Elevator Liability — Some ice and cold storage plants have elevators. These should be specifically included in Liability Insurance for they are always a potential hazard. In Arkansas, a plant was giving away reflector devices to be used on bicycles. One noon two children strayed into the plant, looked into the elevator shaft at the time the elevator was descending. One of them suffered a broken neck. Without Elevator Liability this could have cost the plant owner the profit on several hundred tons of ice.

3. Contractual Liability — It isn't unusual to find railroad sidings as well as icing docks alongside large ice and cold storage plants. Almost without exception when the railroad puts in a spur track it requires the owner to sign a Hold Harmless Agreement, wherein he agrees to relieve the railroad of any liability for injuries occurring on such a spur track. Ordinary liability insurance contracts cover only the liability imposed by law and specifically exclude liability of others assumed under contract. Therefore, if a firm assume any such liability, it must be specifically set out in the insurance contract or there is no protection. In one case it was necessary to eliminate the subrogation clause in the Workmen's Compensation Policy, amend the General Liability Policy to cover liability assumed under contract, and furnish the railroad specimen copies of both policies.

4. Products Liability — Claims have been presented against ice manufacturers arising out of foreign substances in ice. Many large plants carry Products Liability to cover such a loss.

5. Comprehensive General Liability — Several specific types of Liability Insurance have been named such as Plant Liability, Elevator Liability, Contractural Liability and Products. The modern way to buy this protection is to put all your Liability Insurance under a single contract known as the Comprehensive General Liability Policy.

Adequate Limits Needed

Adjust the limits of liability to those that are reasonable and in line with judgments being given in the territory in which the plant operates. To determine what limits should be carried, it is suggested they reflect the financial position of the firm. The minimum limits of liability for any refrigerated products plant should not be below $10,000 per person, $20,000 per accident, and at least $5,000 property damage. Recently an employee was burning trash behind a plant. Fire spread to a neighboring building causing a loss of $3,000. Most plants carry $1,000 property damage. Claims such as this show how the standard limit of $1,000 is insufficient because serious losses do happen to the property of others.

If plant insurance policies do not cover free of charge the liability of executives, directors and stockholders, then the owners should request the insurance company to give this free protection. In many small businesses the executives, directors and stockholders have more money than the business itself, and should not be exposed to a loss; especially when they can be protected without premium change.

Savings Factors Again

As with compensation premiums, if you have been paying overtime, such overtime payroll is not subject to premium charge for public liability. Nor is the payroll of chauffeurs subject to premium charge under Manufacturers and Contractors Public Liability. The reason for excluding it, is because the main exposure to loss is due to the operation of vehicles and therefore covered by Automobile Liability Insurance.

An insured can secure an experience credit if losses have been less than those expected for such a business, providing plant premium is large enough to qualify. Furthermore, there are certain schedule rating plans that give credit for excellent maintenance, safety engineering programs and similar items within owner control that reflect a better than average risk as far as Liability Insurance is concerned.

Last, but not least, an elevator with rise less than 25 feet is rated a one story elevator instead of ordinary freight elevator. This will save a few dollars.

The major types of insurance carried by most refrigerated products plants have been discussed. An owner may also find the following forms are needed for the plant:

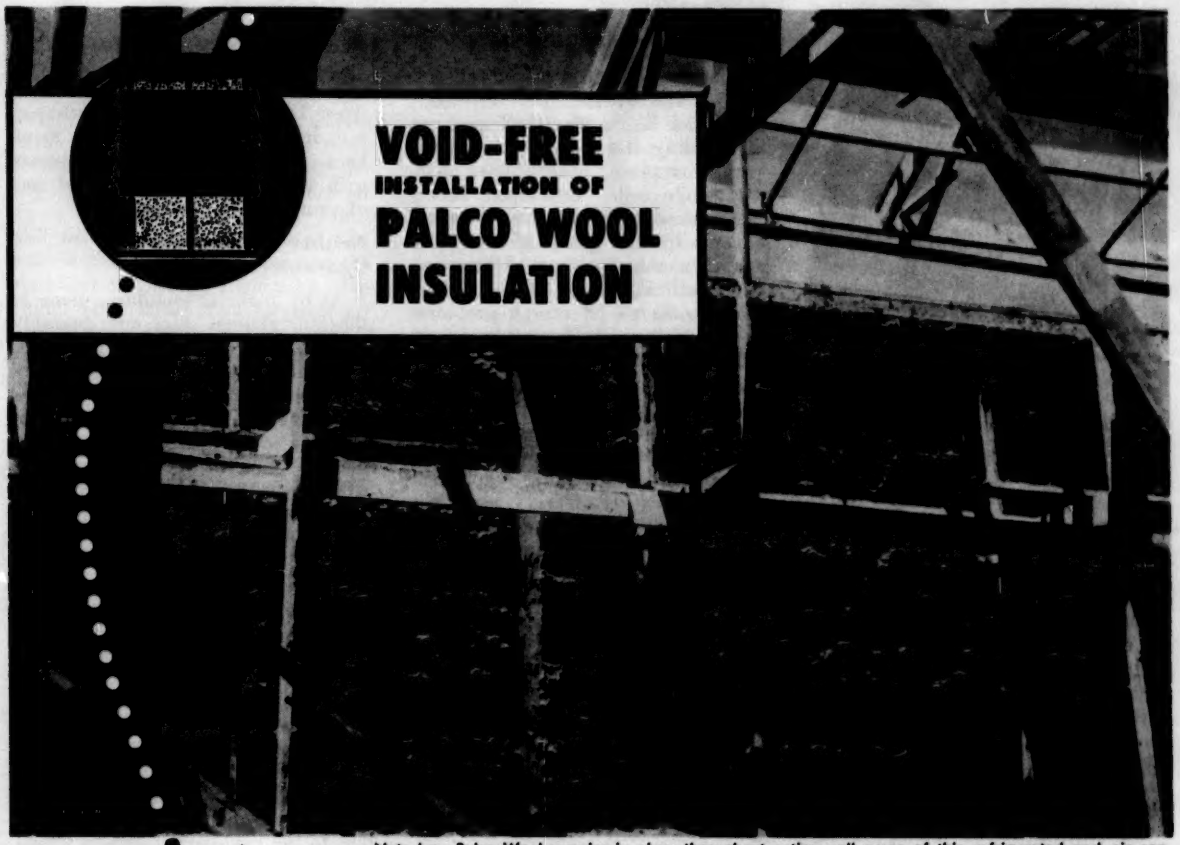
Miscellaneous Forms

Crime Insurance

All forms of Crime Insurance can be purchased on three-year basis, cutting cost by 16-2/3%.

a)—Burglary and Robbery — Pick up the daily newspaper to learn how much money is lost due to burglarizing safes, breaking into premises or robbing a messenger on his way to the bank. Oftentimes driver-salesmen are held up on the route and relieved of the money they have collected.

Crime Insurance is not expensive. It could easily meet the test of carrying insurance against losses large



VOID-FREE INSTALLATION OF PALCO WOOL INSULATION

Note how Palco Wool remains in place throughout entire wall areas of this refrigerated and air conditioned hide storage house of the A. K. Salz Company of Santa Cruz, Calif., allowing full inspection before sheathing is applied.

PERMITS FINAL INSPECTION OF OPEN WALL

PERMITS APPLICATION OF INTERIOR DIAGONAL SHEATHING FOR GREATER STRUCTURAL RIGIDITY

Permanently resilient interlocking fibers of Palco Wool Insulation make it possible to pack entire wall areas to the proper density before interior sheathing is applied. With correct installation, open wall inspection assures void-free installation that is permanenty non-settling to maintain maximum insulating efficiency for the life of the building.

This void-free application is accomplished in three simple steps: 1—A temporary plywood sheet, usually about 2'x8', is spot nailed to bottom of studs in a wall section, and Palco Wool is packed to desired density behind this. 2—A second temporary sheet is added, and packing process repeated. 3—Lower sheet is moved to top, and packing process is continued. These steps are repeated until wall is filled to the top. Palco Wool remains in place for full inspection making it practical to apply diagonal interior sheathing or plywood panels for maximum structual rigidity.

For one of the most efficient cold storage insulating materials known, specify Palco Wool for full void-free effectiveness.

Send for these aids to Better Cold Storage Insulation

THE PACIFIC LUMBER COMPANY

PALCO INSULATION WOOL

100 BUSH STREET, SAN FRANCISCO 4, CALIFORNIA
35 EAST WACKER DRIVE, CHICAGO 1, ILLINOIS

THE PACIFIC LUMBER COMPANY
100 Bush Street, San Francisco 4, Calif.

Please send me, without obligation:
- ☐ Sample of Palco Wool Insulation
- ☐ More details on Void-Free packing methods
- ☐ Complete Cold Storage Manual

Name_____
Title_____
Company_____
Address_____
City_____ Zone____ State_____

enough to seriously effect your financial position, should the loss occur without insurance. Usually the cost of a burglarproof safe can be paid out of the savings in insurance cost, compared to using a fireproof safe over a period of from three to five years. After that there would be a substantial yearly savings on Safe Burglary Insurance.

b)—Dishonesty Insurance — In addition to crime from the outside, owners are faced with the employee who through his dishonesty robs his employer ragged. Thus, Fidelity Insurance is a must where employees have an opportunity to take substantial sums of money out of the cash drawer over long periods of time.

c)—Check Forgery Insurance — Forgery rings are particularly active. Some have been known to drain out the entire bank balance of responsible business firms. Study the exposures of the firm to losses from crime. A proper program can be developed under the new comprehensive forms of insurance that have been created unding recent years.

Boiler and Machinery Insurance

Use of steam boilers requires need of Boiler Insurance — Machinery Breakdown Insurance should be considered. It is not possible to cover all the various ramifications of this type of coverage. Study this problem with a competent insurance man. Hot water heaters are covered by Fire Insurance if the Extended Coverage Endorsement is a part of the building and contents policy.

Cold Storage Locker Insurance

A firm offering locker service will want to protect itself against claims made by customers. Some states require operators of cold storage locker plants to carry insurance protecting customers from loss of their goods as a result of fire and other perils.

Plate Glass Insurance

Some plants occupy leased buildings. It has been the practice of landlords to require a lessee to carry Plate Glass Insurance or pay for Plate Glass breakage. This is a type of insurance that might be classed in the luxury field of insurance. It is a matter of whether the glass replacement service offered by an insurance company is worth the premium. No ice manufacturer or cold storage operator could be put out of business if the firm suffered breakage of all his plate glass without insurance protection.

Employee Benefits Insurance

The rate of personnel turnover in most industries has been extremely high since World War II. Some firms are finding it necessary to develop various employee benefit types of insurance in order to compete in the labor market. These so-called fringe benefits include group life, accident and dismemberment, disability, hospital, medical, surgical care and polio. Many concerns offer such programs as one of their employee benefits, to attract and hold better employees. There are a few in refrigeration industry who are setting up retirement plans for those who grow too old to carry on their former duties.

Such programs may supplement Social Security Benefits. Owners are familiar with the two government types of insurance, Unemployment Insurance and Social Security. Industry contributes to the cost of both these items. Employees should know about this.

Business Life

If a firm operates as a partnership, the owners may wish to set up a business life program tied into a life insurance trust. The purpose of such an arrangement is to provide funds with which to buy the deceased partner's interest from his estate under a prearranged agreement.

Title Insurance

Owners acquiring property for plant purposes should save themselves against loss due to title defects. Title Insurance is cheap, and only has to be purchased once.

Insurance Carrier Selection

The most important part of any insurance program lies in the quality, financial stability and reputation of the companies which insure a firm. In no other product or service is there more misinformation put out to the buying public than that pertaining to advantages and disadvantages of the various systems of insurance. Basically there are four major systems. Each have their ardent exponents. These systems are as follows:

Capital Stock Companies
Mutual Insurance Companies
Reciprocal Insurance Exchanges
Lloyds Organizations

Stock companies and Lloyds organizations basically engage in the insurance business so that the owners of stock or the individual underwriters can make a profit out of the insurance operations. Mutual and Reciprocals on the other hand exist for the benefit of their policyholders. They are known as participating carriers. Some do a general business; others specialize on specific industries. The Reciprocal is a participating organization that enables members of selected industries to insure with one another at the actual cost of providing the protection.

Neither System Nor Size Guarantee Soundness

As to financial soundness, none of the four systems offer any guaranty or advantage over any of the others. Under incompetent management there have been failures under all types of companies. It is no different than running a successful refrigeration plant. There is no more financial strength or guaranty of solvency in a plant run by an individual proprietorship as compared to a plant operated by a partnership or corporation. To judge an insurance company a client should know the management and its past reputation for demanstrated ability to weather depressions, wars and variances in the business cycle.

Neither is size of the company any indication of financial strength. Many insurance authorities point out that a small, efficiently-managed company that has adequate surplus in proportion to the value of business it transacts, and avoids undue exposures in concentrated areas, may actually furnish sounder insurance protection than a company many times its size where less conservative underwriting is practiced.

Tests of Soundness

There are several rules of thumb to apply in judging an insurance carrier. The most significant of course is its combined loss and expense ratio over a period of three to five years. If these combined ratios are less than 100 percent, it indicates the approximate underwriting profit the company has made. Another test is the ratio of its reserve funds to its total assets. Some authorities feel a fire insurance company should have at least one dollar in surplus for each dollar of unearned premium reserve. Casualty companies should have somewhere between 25 and 50 cents in surplus for each dollar of premium written. These are rules of thumb and have to be modified by the loss experience and past record of a particular individual company. Surplus should be adequate to stand abnormal fluctuations in loss experience as well as substantial changes in the stock market.

One sure source of unbiased information about an insurance carrier, is from the local State Insurance De-

partment. The Insurance Department is there to help and protect owners. They don't represent a company and they are not selling insurance. Therefore, for accurate information don't ask the representative of a competing insurance company but write your State Insurance Department. They will tell whether the company is licensed, and whether it meets the standard of solvency required by the State. They know from frequent examination whether a company is sound and pays losses equitably and fairly.

If other refrigerated products plants have insured with the company, ask them about the service rendered. Did the company help them obtain rate reductions? Did they give loss prevention service? How prompt and fair was the company in settling losses?

How to Select A Capable Insurance Man

What are the earmarks of a capable insurance man? How does an owner determine if he's had the experience and training to set up a good program in sound companies? Select on the basis of his professional qualifications and what he's done for others in the industry.

If a firm is faced with a serious lawsuit, owners would seek out the most capable attorney in that field of litigation to handle the case. If an owner were faced with a serious operation, he wouldn't select a surgeon because he was a member of the Rotary Club, or his golf club. The same basis of selection for professional skill should be exercised in selecting an insurance representative. He really looks after a client's potential financial ills. In the event of a serious loss, he can help prevent losing an entire business through inability to collect under improperly written or poorly arranged insurance protection.

Unskilled Insurance Service

Examples of what happens when an insurance man who doesn't know his business tries to handle a complicated insurance program:

1. In Illinois, a plant was located in a built-up business area. It was in a fire zone which prohibited rebuilding a plant of the same type construction should a loss exceed 50 percent of value. This ice man's insurance program did not cover him against loss due to the operation of such building laws. Had he suffered a 50 percent loss he would have been able to collect only one-half of the loss; yet he would have been forced to demolish the unburned portion of the plant. His insurance would only have covered the portion destroyed by fire. Fortunately this defect was discovered before a loss occurred.

2. In a Southern state, a chain of plants had carried their insurance under a form developed by an inexperienced insurance man. Had a loss occurred to any one of the six plants in this chain they would have collected only from 52 to 80 cents on each dollar of loss. It was simple to remedy the defect but it took a skilled insurance man to discover the error.

3. In Wisconsin, a plant was rated as a garage. By making the garage a separate fire division, fire insurance costs were lowered about $700 per year. This savings the first year more than paid the cost of the improvement.

4. In Western Colorado, the value of a garage had been written down for tax purposes so that it stood on the books at a $1.00 valuation. An appraisal disclosed this piece of property was worth $10,000. The insurance man who arranged this insurance didn't know the difference between book value and insurable value, and assumed this property was worthless. No insurance had been carried.

5. In Kansas, a plant had operated for many years as a co-partnership. Two years ago it changed to a corporation. When renewing the Fire insurance on the plant, the inusurance man had never taken the trouble to inquire about the legal title and renewed the insurance in the name of the old partnership.

6. A Missouri plant owner woke up to the fact he was spending more per year for Fire Insurance than was necessary. An experienced insurance man discovered that five years ago the owner had quit storing trucks in his plant. He had built a separate garage to house his trucks. His insurance man had never taken the trouble to check the Fire Insurance rate make-up on this plant, and had never re-rated the plant to have the garage occupancy removed. When this was discovered and re-rating was made by the Inspection Bureau, he received a 50 percent reduction in his Fire Insurance rate.

Services Available

Here are some of the services available from the insurance man:

1. Appraisal and Valuation Service to help determine the insurable value of a plant, and to adjust the values as changes occur in the labor or material market which either increase or decrease the costs of building equipment and machinery.

2. Rate Analysis Service. Changes are constantly occurring in Fire Insurance rates due to things taking place within a plant, or because of exposing buildings, or changes in the rating schedule. Periodic review of fire rates is a must in order to enjoy low premiums and keep the plant as safe from fire as it is humanely possible to do so.

3. Audit Service. Most owners probably use a certified public accountant to make certain that books of account are accurate and properly reflect the financial condition of the business. A similar audit should be made of insurance to see that the firm is properly protected and that policy contracts embody the latest improvements which give all possible reductions in cost.

4. *Loss Prevention.* One sure way to reduce insurance cost for refrigerated products plants individually and for the entire industry is through loss prevention. More than 50 cents out of every dollar spent for insurance goes to pay losses. Anything done to prevent losses or reduce their severity is bound to help all get a further reduction in insurance cost. There are companies that give good inspection and engineering service. The insurer's plant is entitled to this service. If the firm is not getting it, it should be required from the insurance carrier.

Simplification

It isn't uncommon to find small and medium plants where every insurance man in town has a small portion of the insurance. It is easy to understand the desire to let each insurance man have an opportunity to write some of the line. Almost without exception where this condition is found, serious flaws and defects are found in the insurance program. It complicates business bookkeeping and records where a firm handles a multiplicity of small insurance policies.

One plant had over 65 separate insurance policies in force. After a survey was made, the 65 contracts were consolidated into five policies which gave more protection at a lower cost, and only two out of the five had to be renewed each year. What a simplification this was! It made the insurance program easier to watch and the owner better understood the kinds, types and amount of insurance he had.

Last but not least, an insurance man should have had enough experience in insuring ice, refrigeration and cold storage plants to counsel with a client on all phases of the industry's insurance problems.

SUPER MARKET EXPANDS USE OF CORKBOARD INSULATION

After its experience with the effectiveness of corkboard for the insulation of low-temperature spaces, Albany Public Markets, Inc., made two additional installations—one in 1951, the other in 1952. No maintenance work of any kind has been required on these installations since the erection jobs were completed by United Cork Companies' erectors.

Engineering design of the installations was worked out by the Albany branch office of United Cork Companies in cooperation with Albany Public Markets, Inc. Architect for the buildings was Edward J. Toole.

Advantages of United Cork Service

The availability of complete engineering and erection service from nearby branch offices is one of the major reasons why thousands of operators of refrigerated spaces have selected United Cork Companies' BB (Block-Baked) Corkboard as their own low-temperature insulation. Engineering staffs and erection crews are prepared to handle the entire insulation job, and to work in close cooperation with owners, architects and refrigeration contractors.

This nationwide service, which includes a thorough check on the actual performance of the installation, assures customers of the most effective use of the inherent advantages of corkboard insulation.

The type of corkboard produced by United Cork Companies is also of major importance in the effectiveness of insulation jobs. Carefully selected grades of cork are formed into corkboard by United Cork's patented process of block-baking (BB).

Thus United Cork Companies offers a completely integrated responsibility covering every step of the insulation job—from selection of raw materials, through manufacturing, engineering design, and erection of the insulation, to checking of performance.

For more information about the scope of United Cork Companies' service—and about the effectiveness of installations in the toughest service—just drop a line to United Cork Companies, Dept. I-6, Kearney, New Jersey.

U.S. Project Studies Low Temperatures

IN A laboratory shadowed by Colorado's mountains, the Government is secretly exploring a world where temperatures are close to "absolute zero" says a news report. There tough steel turns brittle, rubber loses its elasticity and a kind of liquid helium runs straight up. The work is sponsored by the Atomic Energy Commission and the National Bureau of Standards. The reason for the project was not revealed.

The research institution is the A.E. C.-N. B.C. Cryogenic Engineering Laboratory. Cryogenics is the study of extremely low temperatures. The laboratory was dedicated only two months ago, but has been operating since some time before the explosion of the world's first hydrogen bomb at Eniwetok on Nov. 1, 1952.

The Bureau of Standards has disclosed that super-cold liquids and low-temperature engineering has "applications . . . in guided missiles." Since space between the planets is presumably not much above absolute zero, the laboratory may be examining the behavior of space ship materials at low temperatures.

The bureau said that the laboratory had produced temperatures as low as 450 degrees below zero Fahrenheit. That is only a little more than nine degrees absolute zero, the lowest possible temperature, and several hundred degrees below the coldest weather of the coldest climates.

Frozen Foods Sales Grow In Institutional Market

EYE appeal, labor savings, portion control, wide menu variety and small storage space, have sold frozen foods to the institutional trade of this country. This big and growing industry now buys more than $350-million worth of these products annually and the future market is unlimited, provided packers of the products will continue to stress high quality and standardized grading.

This was the consensus of opinion at a recent luncheon meeting of Eastern Frosted Foods Association held at the Belmont Plaza Hotel at New York, at which the growing market for frozen foods was discussed. Martin Mathews, Sears Sales Co., New York, and association vice president was moderator of the session.

Speakers included George Basso, food buyer for the City of New York. He stressed the popularity of the products in the city's hospitals but urged more and better uniformity in products. His department buys close to a million dollars worth of frozen foods a year and fish sticks and fish cakes, latest items, are moving fast into heavy consumption in the city's institutions.

P. J. Matthews, 36 year old president of Connecticut Pie Baking Co., Hartford, asserted that frozen fruits have made possible the rapid advance in frozen pie production. He said that the present 30 pound frozen fruit container should be obsolesced and asked for a better product sampling procedure in the industry.

Following a tradition of many years, the Association served a complete frozen foods luncheon.

Predicts Sales Rise in Air Conditioning

RETAIL sales of the air conditioning industry this year will rise better than 12 percent to $2,250 million from nearly $2 billion in 1954, Cloud Wampler, president of Carrier Corp., predicted here at a press conference in New York. At the same time, he forecast a 60 percent rise in sales of central residential equipment, which he called the fastest growing segment of the industry, from $100 million last year to $160 million in 1955.

Symposium on Temperature

AN INTERNATIONAL symposium on "Temperature, Its Concept and Measurement" was held at the National Bureau of Standards, Washington, D. C. on October 28, 29, and 30, 1954, to review the present status of problems in the measurement of temperatures from millidegrees to megadegrees. Included for discussion were such subjects as extremely hot gases, low-temperature scales near absolute zero, highly precise methods for measuring temperature, upper atmosphere temperatures, and the temperatures of shock waves caused by supersonic aircraft.

During the five half-day sessions, a total of 25 technical papers were presented before more than 400 scientists representing industry, government, and university laboratories both in the United States and abroad. The symposium was sponsored jointly by the American Institute of Physics, the National Bureau of Standards, and the Office of Ordnance Research, Department of the Army.

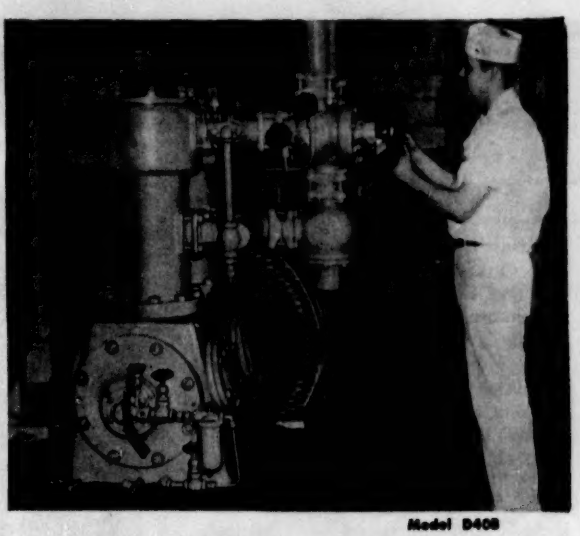
Temperature ranks as one of the most important of the physical quantities, and its measurement and understanding have provided some of the most difficult and challenging problems, both experimental and theoretical, in the field of physics. Three international symposia have now been held to permit exchange of information between the various groups that work with extreme temperatures and precision temperature measurement, and to stimulate research pertinent to these fields of interest. The first symposium was held in Chicago in 1919. The second meeting was held in New York City in 1939 and was sponsored by the American Institute of Physics. It covered a wide variety of subjects, and its proceedings were published under the title "Temperature, Its Measurement and Control in Science and Industry" (Rheinhold, New York, 1941). The third meeting, in 1954, reviewed and summarized the developments that have taken place since 1939.

The opening session of the symposium, with M. W. Zemansky (City College of New York) as chairman, was devoted to discussions of the general concepts of temperature. H. C. Wolfe (Cooper Union) surveyed the general concept of temperature as applied to systems in equilibrium and outlined the procedure for establishing a temperature scale. He also pointed out the limitations to the general concept which arise in attempting to deal with non-equilibrium systems.

Some special cases were treated in greater detail by F. E. Simon (Oxford University), who discussed the concept of temperature near absolute zero, and by G. H. Dieke (Johns Hopkins University), who outlined the procedures and difficulties involved in measuring high temperatures in gases.

C. H. Payne-Gaposchkin (Harvard University) presented a survey of the latest measurements of stellar temperatures. In a later session on transient phenomena, a group of papers were presented on the theoretical aspects of the temperature concept under non-equilibrium conditions and on the approach to equilibrium.

The experimental aspects of temperature measurement were emphasized in three of the sessions. In a session entitled "Standards and Scales," with F. G. Brickwedde (National Bureau of Standards) as chairman, there were discussions of the current status of the International Temperature Scale and of thermodynamic temperature measurements. J. A. Beattie (Massachusetts Institute of Technology) reviewed the nature of the problems involved in precision gas thermometry. H. Moser (Physikalisch-Technische Bundesanstalt, Braunschweig) described recent measurements made in his laboratory with a new type of gas thermometer on the thermodynamic temperature of the gold point.



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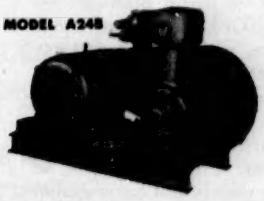
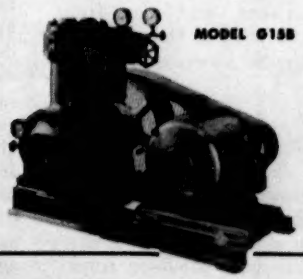


MODEL G158



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SINCE 1913, manufacturers of ammonia compressors, condensers, coolers, fin coils, locker freezing units, air conditioning (cooling) equipment. Immediate delivery!

Large Refrigerated Warehouse Center to Be Opened by Calumet Industrial District

A LARGE warehouse center is being planned by Calumet Industrial District Co., on the south side of Chicago. The project which will cost $25 million, will include 12 warehouse buildings, each of which will be 226 feet wide and 1,000 feet long. Completion of the project is scheduled for 1958.

The Calumet Industrial District is located in one of the last large land areas in Chicago, a 400-acre tract at 95th Street and Stony Island Avenue. The initial development will include one-half the area, and the twelve buildings will be located in a mile-long tract on the west side of Stony Island Avenue, from 95th to 103rd Street. The District will utilize all forms of transportation — rail, truck and water.

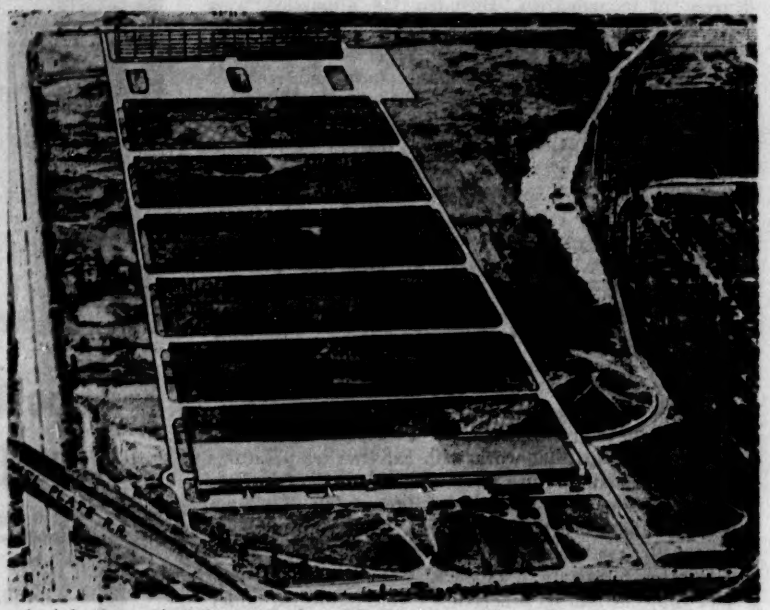
Transportation

The nearby Rock Island and Nickel Plate railroads are cooperating with the privately owned Calumet Industrial District Company in this project. They and their connecting lines will form a network of rail distribution from coast to coast and from the Gulf to the Canadian Border. Both railroads have make-up yards close by the premises. The District also is adjacent to three major highways — 95th Street, 103rd Street, and Stony Island Avenue, which is the gateway to the Calumet Tri-State Expressway.

Deep water transfer facilities will be available at the District-owned 1,000-foot marine dock on the nearby Calumet River. Shipments will be made by lake vessels and barges from all points over the 10,000 miles of inland waterways, and also from world ports, via New Orleans and, eventually, the St. Lawrence Seaway.

Buildings

Each of the twelve buildings will be 1060 feet long by 236 feet wide, an area of about 250,000 square feet, or roughly the size of two city blocks. They will be steel and concrete construction, wide-span, one-floor, truck-dock high, with 18-foot stacking height for palletized merchandise. Enclosed rail sidings will run along the length of one side of each building, and truck doors the length of the opposite side. Freight cars and trailers can be unloaded inside, giving full all-weather service. Modern mechanical handling methods will be used for interchange of merchandise within and between buildings as well as for storage and handling.



Aerial view of Calumet Industrial District with architect's conception of completed refrigerated warehouse superimposed.

Architects for the Calumet Industrial District are Lundstrum and Skubic, Inc., of Chicago, and the contract for construction work was awarded to Campbell-Lowrie-Lautermilch Corporation, also of Chicago.

Food Storage

The purpose of this vast, ultra-modern food center is to house the inventories of principal food manufacturers throughout the country. From the approximately 3,000 large-demand items that will compose these combined inventories, the food wholesalers and chains can draw as often as desired, in quantities as needed. Orders will be pooled by the Calumet Industrial District and loaded into solid pooled carloads or truckloads, as directed by wholesalers or chains and as approved by the manufacturers who own the inventories. At present, much merchandise is shipped by each manufacturer is less-than-carload quantities, at about twice the solid carload rates. This pooling will permit the same amount of mixed merchandise to move in one solid carload or truckload, at the greatly reduced carload rate.

The Calumet Industrial District food center will become, in effect, a super warehouse for all wholesalers and chains. It will keep a daily automatic stock inventory record for each manufacturer, so that wholesalers may safely gear to a higher rate of turn with full confidence of manufacturer's inventory always on hand. A daily record of shipments will be supplied to each manufacturer for use in invoicing the wholesaler.

All facilities, services and personnel will be supplied by the Calumet Industrial District, unless a manufacturer prefers to operate from his own leased space with his own employees, in which case he can lease whatever space he requires from the District at reasonable rates. Under either plan, the manufacturer may participate in pooling shipments with other manufacturers maintaining inventories in the District.

About one-third of the first building has been completed and leased by The Kroger Company of Cinncinnati, which recently occupied the space. The remainder of this building, about 174,000 square feet was expected to be ready for occupancy during December. This first unit will have air conditioned space at 70 and 45 F. The second building is scheduled for

(Continued on page 47)

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QUICK FACTS ABOUT genetron REFRIGERANTS:

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- Non-toxic, non-flammable, stable, safe
- Critical and freezing points are well outside range of operating uses
- Solvent action on oil helps prevent solidification or congealing of lubricant
- Miscible with oil; aid in lubrication of equipment

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For further information on "Genetron" *Super-Dry Refrigerants*—see your wholesaler, or write or phone any General Chemical office listed below.

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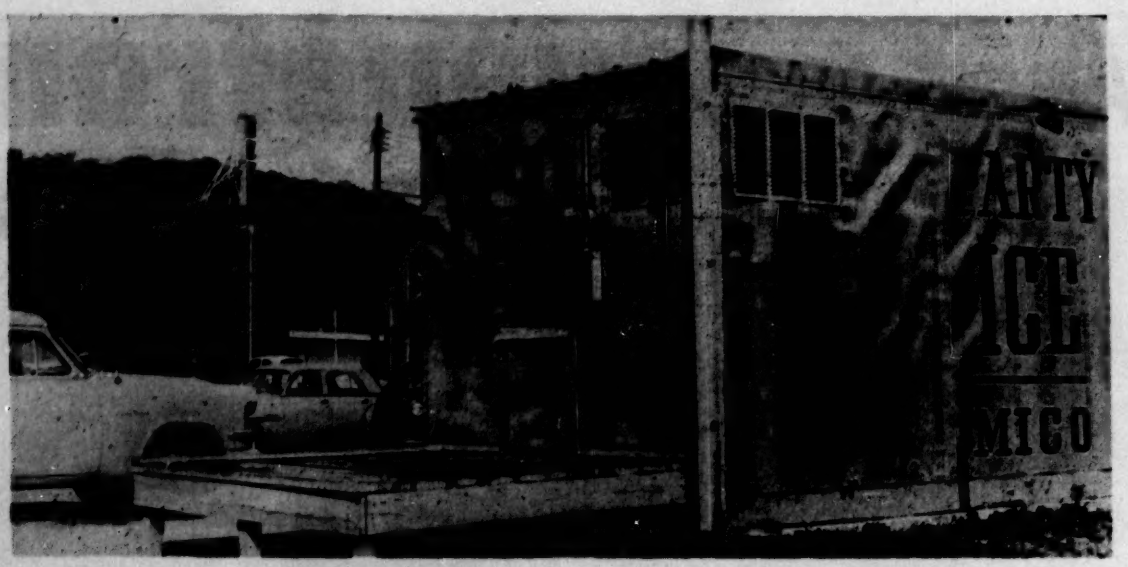


One of the seven vending stations operated by The Mutual Ice Company, Alexandria, Virginia. This is a rear view showing the loading platform.

A Boom in Ice – Increasing Vending Sales Points to Bigger Future Sales

O. A. REARDON
Mutual Ice Company
Alexandria, Virginia

WE HAVE seven off-the-premises vending stations located in shopping centers, super filling stations, busy through-highway intersections, and densely populated areas of arterial highways. Our first location was adjacent to a delicatessen in a large apartment development area, poorly located for "seeability" from three roads and only visible to the fourth and least travelled. In spite of all these handicaps this station is far ahead of any other installations, which leads us to believe that whereever they are located within reason will do if the people are made conscious of their location.

The only location abandoned was, singularly enough, the one from which we expected the most. However, not all of the fault was in the location. The operator of the adjacent service station could not succeed in having his employees properly maintain the vending machine for which he was contractually obligated.

Types of Operating Contracts

We have two types of operating agreements, one being 20 percent of gross sales, less the power bill and mechanical repairs, for which the property owner agrees to furnish the site; keep the racks filled with ice from storage area within the box, placing both kinds of ice properly and neatly on the belts to prevent the fouling of ice both on the belts and at the point of vending; make periodic inspections of the vending equipment and temperature, notifying us of any mechanical failures and of the need for more ice; and keep the area around the station in a clean and orderly condition. The second plan carries a 12½ percent commission on gross sales, less the same deductions as in the first, the only change being that the ice company performs all the services with the exception of the outside housekeeping. We will lease a vending station outside the city limits only on the 20 percent basis. Our public liability insurance covers the ice company and the owners of the properties up to $300,000 for any suits arising out of the location and public-operation of the venders.

Construction

We are now building our own stations. They are 16 x 10 x 8 ft or two feet wider than the conventional type offered for sale, giving us nearly 75 percent more usable storage space for solid ice and 90 percent more for bagged ice, at no increase in power over a purchased station. Our framing is of Douglas fir, 6-inch sidewalls and floors with 8-inch ceiling joists; interior finish is ⅜ inch boat-hull plywood, varnished; one layer of 15-pound felt paper; 6-inch Fibreglass insulation; one layer of 30-pound felt paper, sealed; one layer of ⅜ inch boat-hull plywood, varnished; and covered with 25/1000 aluminum sheets, joined by aluminum beading screwed to the plywood.

This wrinkled a little on our earlier boxes, so we now drill the bolt holes in the aluminum sheets and end-straps a little larger than the screw shafts, allowing enough expansion space for the sheets to ride free. Ceilings are the same as the sidewalls, except for both 8-inch joists and insulation. Floors are the same as the sidewalls, plus a working floor of 1-inch T & G oak flooring on 30-pound felt paper, mopped in with hot asphalt. Roof construction: 2 by 4's above ceiling joists, covered with ⅞ inch sheathing and 3-ply roofing paper, the outer covering being 5-V aluminum roofing of the lock-joint type.

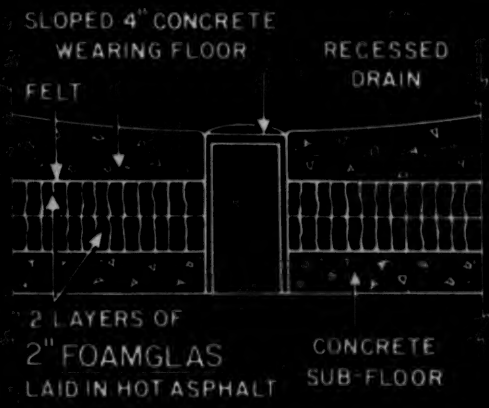
Refrigerating System

The refrigerating system consists of a 1-hp automatic electric defrost-

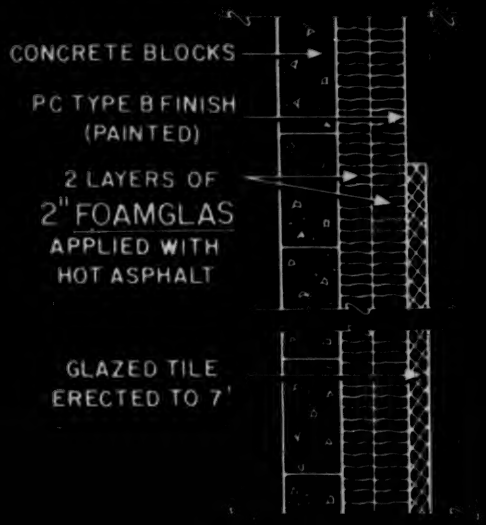
Paper presented at Annual Ice Convention

FOAMGLAS®

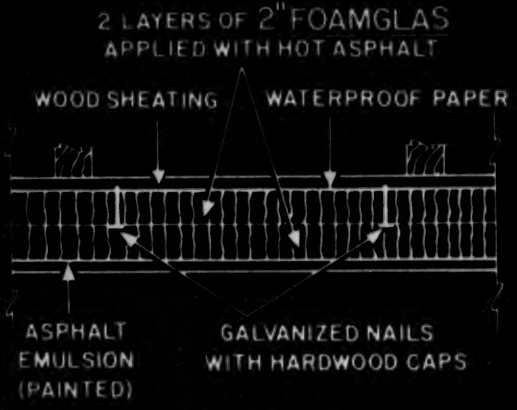
the cellular, stay-dry insulation



DETAIL C
TYPICAL FLOOR SECTION



DETAIL A
TYPICAL WALL SECTION


2 LAYERS OF 2" FOAMGLAS APPLIED WITH HOT ASPHALT
WOOD SHEATING
WATERPROOF PAPER
ASPHALT EMULSION (PAINTED)
GALVANIZED NAILS WITH HARDWOOD CAPS

DETAIL B
TYPICAL CEILING SECTION

"FOAMGLAS insulation proved it stays dry by stopping seepage into our cooler"

reports H. S. Moore, Bohrer & Moore Packing Company, Wapakoneta, Ohio

Use of FOAMGLAS insulation has benefited an Ohio meat packer in several unusual ways. Harry Moore of Bohrer & Moore Packing Company explains it this way:

"We built an addition for a meat cooler and two freezers back in 1950. The back walls of the cooler and one freezer are about four feet below grade. The cooler was completed first. We had a lot of trouble with seepage through the uninsulated wall of the cooler. Later we installed FOAMGLAS on the inside walls of the freezer and we haven't been bothered again with seepage."

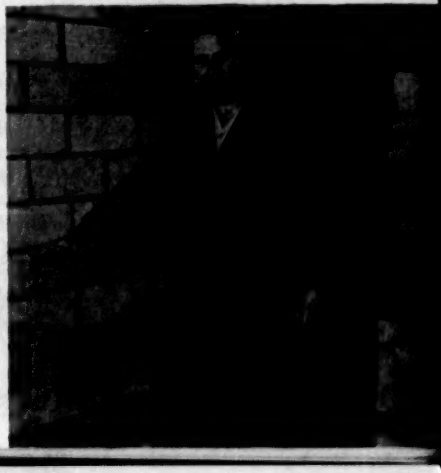
Mr. Moore also gives his cellular glass insulation credit for withstanding extremely heavy floor loads, reducing vermin trouble to an absolute minimum and enabling them to maintain economically a constant 38° F. in the cooler and 8° F. in the freezers.

Throughout the meat-packing industry more and more plants are switching to this unique insulation, the only one composed of sealed glass cells which are waterproof, fireproof, rot-proof and vermin-proof. This remarkable combination of properties makes FOAMGLAS the ideal insulation for *your* plant, too.

For more facts on how to install and finish FOAMGLAS, write today.

Pittsburgh Corning Corporation
Dept. T-25, One Gateway Center
Pittsburgh 22, Pennsylvania.
In Canada: 57 Bloor St., W., Toronto, Ontario

Owner Harry Moore indicates the grade line on the rear wall of his cooler. Bohrer & Moore was bothered with seepage of surface moisture into the adjacent freezer until it was insulated with FOAMGLAS. Engineer & Contractor was Russell Dresher, Wapakoneta, Ohio.



Below: Automatic weighing and bag filling equipment for 7½ pound bags of party ice.

Right: Hand truck loaded with eight canvas bags with ten bags each of party ice, ready for loading on truck.

ing blower unit, thermostatic control, and automatic door switch to cut off the blower when the door is opened. We install a 16 x 24 inch door in the rear of the box and a 6 x 10 ft platform behind it to facilitate the fast filling of the station.

Vending Methods

We vend 25 pounds of solid ice in one rack and 7½ pounds of party ice in two racks. The customers have decided how much party ice we put in a bag. We started vending 15 pounds for 25 cents, reduced it once to 12½ pounds and, later, to 7½ pounds. We stopped reducing the size of the bag when the customers discontinued exclaiming, "Too much ice to carry", and with deep-freezes at home waiting to preserve the left-over ice, we feel quite sure the smaller the package you sell the more sales you will make. Fifteen-pound sales, with half of them going into the deep-freeze, cut sales in half.

We experienced so much difficulty with the three-way coin-plays, such as customers putting in a nickel or a dime to get their money's-worth, never reading the largest letters directly in front of the money slots indicating "25 c Minimum Sale", that we gave up trying to educate the public to read directions. Business houses adjacent to the stations complained of having to make too much change for our customers. Now only Quarters can be used.

Our party ice is screened to about the size of a Guinea egg with an extra comb installed behind the main comb on the crusher, which eliminates the long icicles which occasionally slip through the standard one-comb crusher. We have spent five years and considerable money in publicizing "Party Ice" and it is now very well accepted. The 7½-lb. bag contains about 148 properly-sized pieces of crystal-clear ice. We do not sell cubes.

Servicing

Servicing these boxes is, as yet, not the best. At the present time maximum servicing is done very early in the mornings on long hauls. We put ten bags of party ice in old 100-pound canvas ice bags in the Receiving room, put all solid ice in front and on the sides, then quickly run the 100-lb. canvas bags out of storage on a flat-bottom handtruck holding ten bags. A large, pre-cooled tarpaulin is spread one-half on the bottom of the truck, the bags are loaded on it, and the balance of the cold tarpaulin is then pulled over the top of the load. Next summer we expect to have an insulated, refrigerated truck for this service. We send two men out on the truck, one to work inside the station and the other from the truck.

Sizing and Bagging

Crushing, sizing and bagging have steadily improved during the four years we have been experimenting. We are now using a 100-lb crusher, elevator, and revolving screens for two grades of ice, fine and party ice. We have two large bins located at the front end of the receiving room close to the retail platform wall. At the plant we sell 25 pounds of fine crushed and 12½ pounds of party ice, each priced at 25 cents. This is accomplished by a chain conveyor direct from the bins to the bagging spout. Under each bagging spout is a spring-balance scale set for the correct amount of ice. The bag is inserted under the spout, a button is pushed, and the ice falls directly into the bag. When the desired amount is in the bag, the scale automatically cuts off the flow of ice. About five seconds.

The bagging of party ice for vending stations in 7½-pound packages is done by three revolving cylinders under the bin, each cylinder holding 7½-pounds. This cylinder revolves under the bin and over the bagging spout and is actuated by a motor-driven clutch controlled by a foot pedal or a hand pushbutton. A simple push of the button or pedal fills a bag immediately. (See illustration) One man now bags, seals with ¾ inch locker tape, and places the smaller packages in the large canvas bags ready for delivery, approximately 380 packages in an 8-hour day.

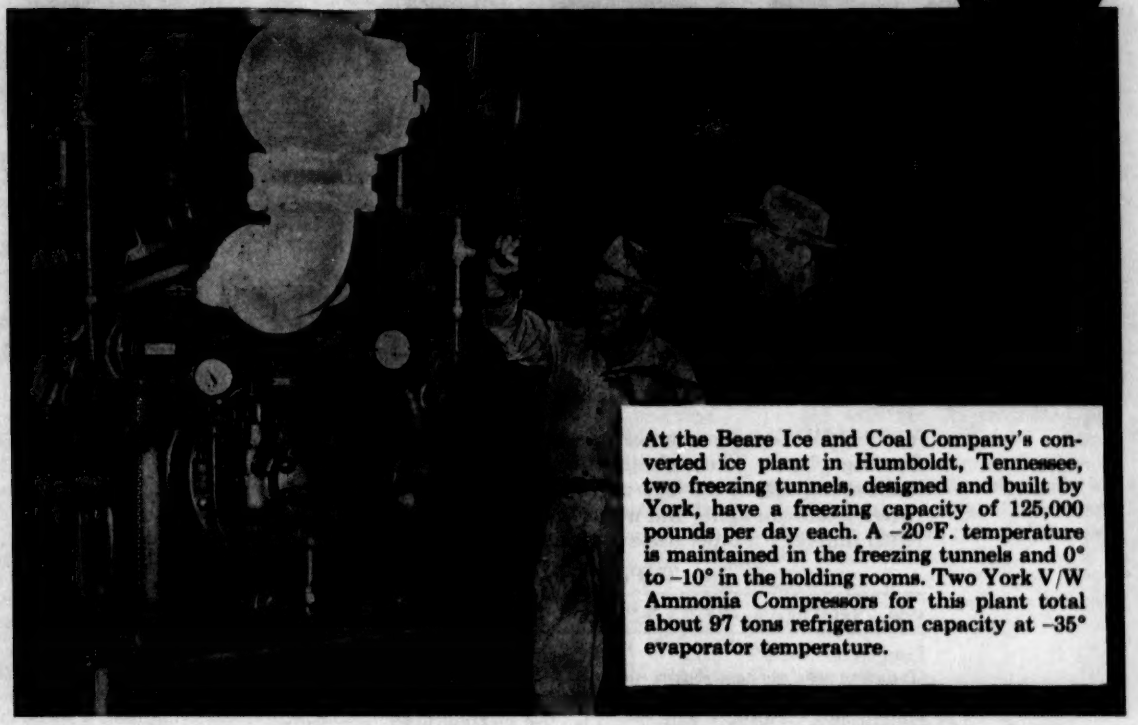
We have experimented with the coin-play devices to the point where they will reject practically all slugs and foreign monies except the real new Canadian quarters (which are worth more than ours), and the copper band which is skillfully pressed around a penny. The size is exact and the weight so close that it works the device every time, but it must take a man at least one hour to make it.

To help keep the box temperature down and reduce formation of frost on the belts, we installed a ½-inch rubber flap on the small loading door

(Continued on page 47)

NEW facts for your files on York V/W Ammonia Compressors for

Quick Freezing Plants



At the Beare Ice and Coal Company's converted ice plant in Humboldt, Tennessee, two freezing tunnels, designed and built by York, have a freezing capacity of 125,000 pounds per day each. A –20°F. temperature is maintained in the freezing tunnels and 0° to –10° in the holding rooms. Two York V/W Ammonia Compressors for this plant total about 97 tons refrigeration capacity at –35° evaporator temperature.

FREEZING ROOMS CAN DOUBLE AS HOLDING ROOMS—and refrigerating equipment must fill each need economically. York V/W Refrigerating Compressors offer outstanding flexibility of operation for greater economy.

BIG POWER SAVINGS—Starting power requirements are reduced because compressor starts unloaded. Automatic or manual control of cylinder unloaders provides extreme flexibility. This permits selecting most economical stage of operating capacity to balance changing plant loads. Power requirements are reduced in almost direct proportion to load reductions—28% power at 25% load, for example.

EASY INSTALLATION—Compact, lightweight, balanced design of York V/W Refrigerating Compressors eliminates need for special foundation (requires only a level floor). Freedom from vibration permits upper floor installations.

ENGINEERING SERVICE—York's vast experience in the freezing and storage of foods is part of a *complete* York service available to your design engineer.

Some Helpful Hints for Quick Freeze Men

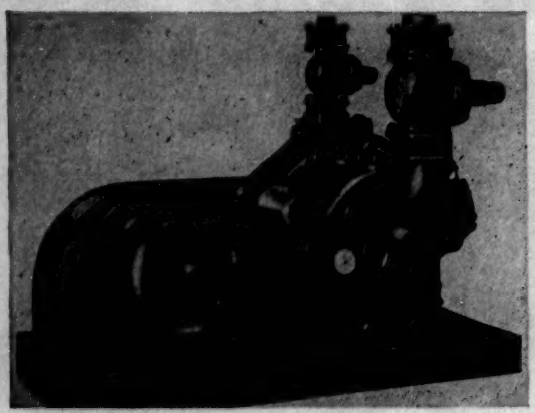
1. To speed merchandise handling and reduce the loss of refrigerated air from freezing areas, provide pull cords which fork lift truck operators can reach from their seats and which automatically open and close the cold storage doors. Platforms should be designed with sufficient width (approximately 20 ft.) to permit such operation.

2. To assure proper air circulation and uniform low temperatures of frozen foods in cold storage areas, provide air circulation space between pallets and packages and keep packages from contacting walls.

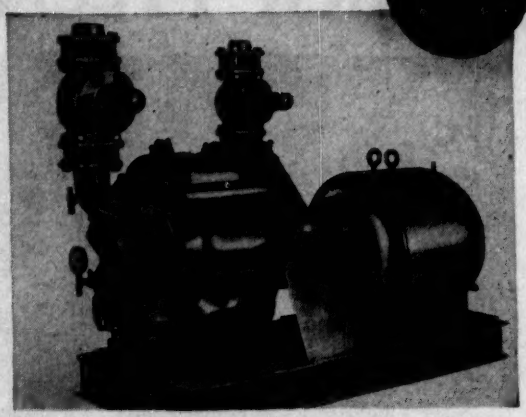
3. Heating coils installed in the lower slab of a concrete floor will prevent frost heaving in freezing and food storage areas. Coils should be kept at approximately 50°F. with automatic thermocouples to control temperatures.

YORK V/W AMMONIA COMPRESSORS FOR QUICK FREEZING PLANTS (CONT'D)

YORK V/W AMMONIA COMPRESSORS



4-cylinder V/W Ammonia Compressor (Belt Drive)



8-cylinder V/W Ammonia Compressor (Direct Drive)

York V/W Compressors bring great flexibility of operation to quick freezing plants. Their ability to operate at various stages of capacity realizes important savings on operating costs during off-season periods (when loads are light) and when freezing rooms double as holding rooms (with different temperature requirements for each duty).

TYPICAL DIMENSIONS

V/W—BELT DRIVE—3¾" x 3"	V/W—DIRECT CONNECTED—3¾" x 3"
Length 69"—76"	Length 75¼"—105 1/16"
(Including motor and depending on model)	*(Including motor and depending on model)*
Width 39¼"—45"	Width 30½"—38⅜"
Height 46½"—48½"	Height 48 11/16"—57⅞"

PRINCIPAL FEATURES

FLEXIBILITY OF OPERATION—York V/W Compressors offer various stages of capacity reduction through automatic or manual unloading for greater flexibility of operation. An 8-cylinder V/W Compressor, for example, has 4 stages of capacity reduction.

EASY MAINTENANCE—All wearable parts—including cylinder liners, valves, bearings, oil pumps and unloader power units—can be easily removed and replaced when worn. Thus, prolonged and expensive shutdowns can be avoided, and original operating efficiency is maintained. IT *CAN'T* WEAR OUT.

EASY INSTALLATION—Compact size, extremely low weight per cooling unit and vibration-free operation minimize space requirements and permit easy installation. Even upper floor installations are possible without special foundations.

OPERATION

York V/W Compressors give efficient use as single units in refrigeration systems up to 300 tons capacity and where evaporator temperatures are above –20°F. In quick freezing plants with evaporator temperatures running to –20°F. and lower, it is recommended that a compound compression system be installed with a York Booster Compressor acting as the low-stage compressor. This type of installation will usually justify itself through reduced operating expense and first cost of equipment.

SPECIFICATIONS—STANDARD UNIT

CAPACITY—5 to 300 tons capacity in a single unit.

CYLINDERS—4, 6, 8, 12, or 16 cylinders (depending on model), and arranged in a V, W or VV.

HOUSING—Close grain iron casting with removable cast alloy iron sleeves fitted into cylinders.

CAPACITY REDUCERS—Capacity reducers, including necessary steel tubing orifices and hand-operated stop valves are furnished as standard equipment. Automatic capacity reduction extra.

LUBRICATION—Pressure lubrication for all bearing surfaces from a single pump geared to crankshaft.

SHAFT SEAL—Positive packless type under continuous oil head. Refrigerant can't leak out—air can't leak in. Friction wear at a minimum.

York Corporation, York, Pa.

YORK CORPORATION

the quality name in air conditioning and refrigeration

HEADQUARTERS FOR MECHANICAL COOLING SINCE 1885

Practical Refrigerating Engineer

NATIONAL ASSOCIATION PRACTICAL REFRIGERATING ENGINEERS

How Dangerous Is Ammonia?

Almost weekly these questions come up, "Will it explode", "Will it burn", "Can it suffocate"? Well . . ., does it?

E. M. HOLADAY
Utilities Distribution Engineer
Anheuser-Busch, Inc.

IS THERE a real danger of ammonia explosion in a refrigeration system? Is there a real health hazard from ammonia vapors in a well-operated plant? The following remarks are intended to summarize some published data and to indicate reasonable answers to these questions.

Fifty years ago a refrigeration textbook stated,[1] "It appears that the dangers of ammonia in case of fire have been greatly over-rated, and at least in the beginning of a fire it acts as an extinguisher rather than otherwise."

Fire Hazard Small

In 1942, the NAPRE Operating Data Book contained the statement,[2] "In its pure state, it requires temperatures of 1200 to 1500 F to make it (ammonia) inflammable. This might be done in a laboratory but not in a refrigeration piping system." This further statement appears in the 1945 NAPRE Operating Data Book:[3] "Under normal conditions ammonia will burn in air only while in contact with a flame. If the flame is removed, the ammonia stops burning. Ease of combustion may be increased by higher pressures, higher concentrations of oxygen, or by the addition of catalysts. The fire hazard of ammonia may be said to be extremely small."

According to the U. S. Bureau of Mines, ammonia can burn[4] when mixed with air in concentrations of more than 16 and less than 27 percent ammonia by volume. This is confirmed by the observation of welders[5] making emergency repairs with escaping ammonia impinging on the welding flame. They reported that the ammonia vapor would burn in the flame of the torch, but would not continue to burn after the torch was extinguished.

A few years ago a "disastrous ammonia explosion" was reported in New York City. However, investigation revealed[6] that the explosion was in a steam boiler using powdered fuel, and that the nearest ammonia was in a refrigeration system across the street from the explosion.

There have been explosions in ammonia systems, but these can nearly always be attributed to oil mist or vapors. Some time ago the telltale pipe on an accumulator in a brewery refrigeration system had to be replaced. The Chief Engineer[7] recognized the possible hazards. That section of the system, including the accumulator and connecting headers, was thoroughly pumped out and then purged with air. As an added precaution, the bonnet was removed from an 8-inch valve on the header nearby, and the open valve body was covered with a piece of cardboard. Almost as soon as the torch was ap-

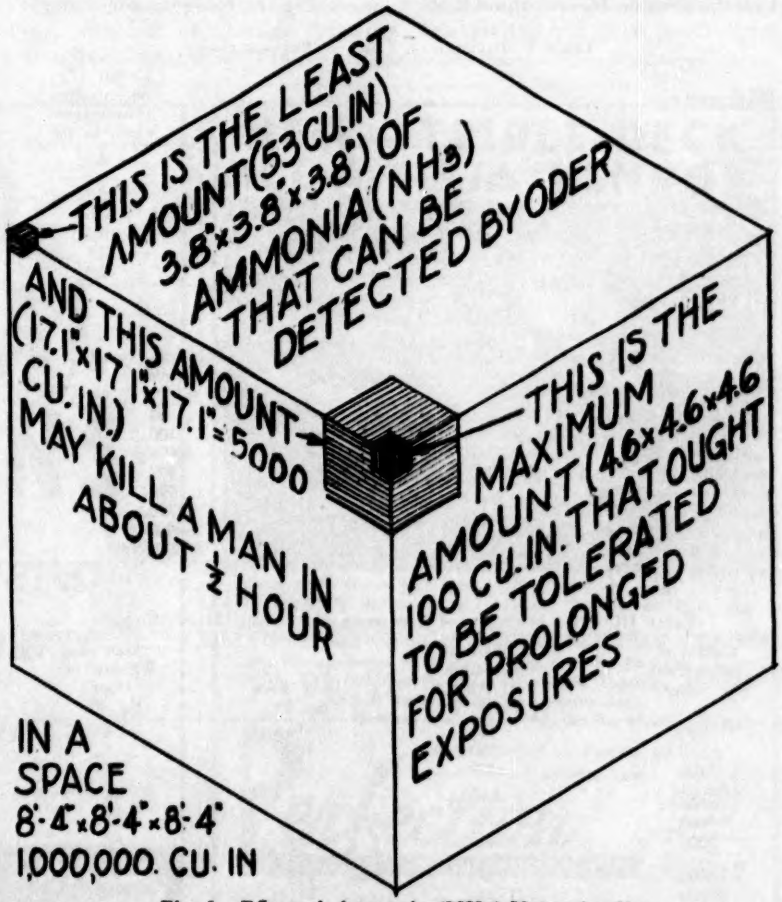

THIS IS THE LEAST AMOUNT (53 CU. IN) 3.8"x3.8"x3.8") OF AMMONIA (NH3) THAT CAN BE DETECTED BY ODER
AND THIS AMOUNT (17.1"x17.1"x17.1"=5000 CU. IN.) MAY KILL A MAN IN ABOUT ½ HOUR
THIS IS THE MAXIMUM AMOUNT (4.6x4.6x4.6 100 CU. IN. THAT OUGHT TO BE TOLERATED FOR PROLONGED EXPOSURES
IN A SPACE 8'-4"x8'-4"x8'-4" 1,000,000. CU. IN

Fig. 1—Effect of Ammonia (NH_3) Vapor in Air.

Paper given before St. Louis Chapter, NAPRE, 1954.

EXECUTIVE OFFICE NAPRE
433 N. Waller Ave.,
Chicago 44, Ill.
OFFICERS
President: Regis Gubser
Los Angeles, Calif.
Secretary, J. R. Kelahan, Chicago 44.

Operating engineers of all refrigerating plants are invited to affiliate with the National Association of Practical Refrigerating Engineers, an educational association.

plied to cut off the telltale pipe the vapor in the accumulator exploded and the cardboard plate on the valve body relieved the system sufficiently to prevent any damage. In this case the explosion might have been attributed to ammonia if the system had not been so completely purged. The actual cause of the explosion seems undoubtedly to have been vapors from an oil coating on the inside surface of the accumulator.

Hydrogen has been mentioned as a possible cause of explosions in ammonia refrigeration systems.[8] This usually takes a much higher temperature than exists anywhere in a refrigeration system, but it is conceivable that oil vapors, or the hot metal in compressor cylinders may catalyze the reaction. Even if this does take place, there should be no dangerous accumulation of hydrogen unless the purging of non-condensible gases is neglected.

Real Toxic Hazard

An ammonia hazard that is more real than the danger of fire and explosion is its toxicity. Familiarity with the odor makes it easy to overlook the possible danger of prolonged exposure to substantial concentrations of the vapor. Ammonia is more toxic than any of the common refrigerants.[9] A comparison of the lethal concentrations and exposures is indicated in Table I. The physiological effects of breathing various concentrations of ammonia vapor are indicated by Table II.

Observance of these practices will go a long way toward eliminating refrigerating plant catastrophes.

The difference between a fatal concentration and the least amount that can be detected by odor may be visualized by assuming a cubical space of 100 inches (8.3 ft.) in each dimension. This will contain 1 million cubic inches, and a volume of 53 cubic inches, or a cube with 3.8" sides, will represent the amount of ammonia that can just be detected by odor. A cube of only 17.1" sides will contain 5000 cubic inches, or an amount which may kill a man on short exposure. (See Fig. 1)

Safety Precautions

The refrigerating engineer can minimize the hazards of ammonia by practicing the following precautions:

1) Purge the system continuously, or at sufficiently frequent intervals to avoid any accumulation of non-condensible vapors.

2) When welding repairs are necessary, pump out system, ventilate, and provide ample area for pressure relief in case oil vapors cannot be completely eliminated.

3) Reduce leakage to a minimum.

4) Provide ammonia gas masks, and train men how to wear them properly.

a) There should be a sufficient number of masks for all employees who may have to enter contaminated areas.

b) The masks should be conveniently accessible in locations not likely to be severely contaminated.

c) The masks should be periodically inspected to insure good mechanical condition, and to make certain that the chemical canister has ample absorbent capacity.

d) Men should periodically practice wearing the masks, so that there will be no mistakes or delays when emergencies arise.

5) Provide adequate means for quick and effective ventilation. Table III is an abbreviation of data specified in American Standard ASA B19.1—1950," Safety Code for Mechanical Refrigeration.

TABLE I—TOXICITY OF COMMON REFRIGERANTS

Refrigerant	Duration of Exposure	Lethal (*) Concentration % by volume Vapor in air
Ammonia	½ hr.	0.5
Sulfur dioxide	5 min.	.7
Methyl Chloride	2 hr.	2.0
"Freon-11"	2 hr.	10.0
"Freon-22"	½ hr.	10.2
"Freon-12"	2 hr.	28.5
Carbon dioxide	½ hr.	29.0

(*) to guinea pigs.

TABLE II—EFFECTS OF BREATHING AMMONIA

Physiological Response	Ammonia ppm by volume in air (*)
Least detectable ordor	53
Max. allowable, prolonged exposure	100
Max. allowable, ½-1 hr. exposure	300-500
Immediate throat irritation	408
Immediate eye irritation	698
Coughing	1720
Dangerous, ½ hr. exposure	2500-4500
Fatal, short exposure	5000-10000

(*) 10,000 ppm = 1%

TABLE III—MIN. VENTILATION CAPACITIES FOR REFRIG. MACH. ROOMS

Weight of Refrigerant in System lb.	Mechanical Discharge of Air cfm.	Duct Area Sq. Ft.	Area of Window or Door Sq. Ft.
20	150	¼	4
50	250	1/3	6
100	400	½	10
500	1275	1¼	22
1000	2050	2	31
5000	5500	4½	62
10000	9500	6½	90
20000	15200	8¼	130
30000	18200	9	145

References

(1) J. E. Siebel, Compend of Mechanical Refrigeration 6th Ed., Nickerson & Collins, Chicago, 1904.

(2) Robert C. Doremus, Quiz Answer No. 2 NAPRE Operating Data Book, NAPRE, Chicago, 1942.

(3) G. B. Bachman, Purdue University, NAPRE Operating Data Book, p. 89, NAPRE, Chicago, 1945.

(4) U. S. Bu. of Mines Bull. 279, 1928, cited in Penn. Salt Mfg. Co. Data Book AR 551, 1944.

(5) H. W. Becke, unpublished report of experience.

(6) R. T. Brizzolara, "Is Ammonia the Cause of Refrigeration Plant Explosions?" Refrig. Eng., Nov. 1951.

(7) H. W. Becke, loc.cit.

(8) R. T. Brizzolara, loc.cit.

(9) Refrigerant Tables, Charts, and Characteristics, Amer. So. Refr. Engr., New York, 1950.

(10) From Henderson & Haggard, Noxious Gases, Chemical Cat. Co., New York, 1927, cited by Penn. Salt Mfg. Co. Data Book AR 551, 1944.

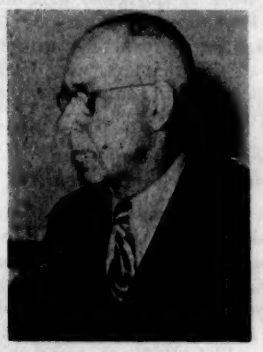
(11) Amer. Soc. Refr. Engr., Safety Code for Mechanical Refrigeration, New York, 1950.

NAPRE Sets Fall Dates For 46th Convention

LOS ANGELES has been selected as the site for NAPRE's 46th annual meeting. To be held November 8-10, 1955, the affair will be at the Ambassador Hotel. California Chapter No. 2 will be Host. According to Regis Gubser, National President, Wm. Ray Burnett, a national director, will be general chairman, assisted by Frank Eccleston, Edgar Marrs, and Dale Rycraft. Convention directors are E. T. Quinn, Elmer Johnson, Don Byl, and Gubser. Exhibit arrangements are under supervision of E. T. Quinn, national past president.

Personalities in "Brass"

FIRST vice-president of NAPRE in 1955 is Leroy Etzel, Superintendent of Refrigeration, Pacific Fruit Express Company, a subsidiary of the Union Pacific and Southern Pacific Railroads. Leroy has been a member



Leroy Etzel

of NAPRE since 1921 and is a past president of two chapters, a feat not often accomplished. He served as president of the Sacramento, California, chapter for a couple of terms, and had a term as president of California No. 1 at San Francisco. He has previously served as a director, board chairman and second vice-president of NAPRE.

Mr. Etzel started his refrigeration career in 1920 with the Pacific Fruit Express Company at Roseville, California. From Roseville he transferred to Omaha, Nebraska and Pocatella, Idaho plants of his firm, returning to Roseville as chief engineer prior to World War II. In 1946 he became Superintendent of Refrigeration and makes his headquarters in the Rialto Building, San Francisco.

He has been a member of ASRE since 1946. Mr. Etzel makes his home on Radnor Road, in Oakland, California. His principal responsibility as first vice-president, is the welfare of the chapters of NAPRE. His several terms as chapter president qualifies him well for that responsibility.

Chicago NAPRE Chapter Plans Education Meet

FIRST regional education conference in post-World War II years for NAPRE, will take place April 30-May 1, at the Congress Hotel, Chicago, with that city's chapter as host, it has been announced by Bert C. McKenna, Chairman. It is expected that nine chapters in "over-night" transportation range of Chicago, will participate. Assistant Chairmen appointed are Roy T. Burns, Detroit, and C. Ward Stoner, Milwaukee.

Sub-committee chairmen appointed by conference chairman McKenna were: Alex Duffy, accommodations; Hubert Rancour, transportation; William B. Richards, finance; Eugene Rytlewski, education; Earl McMichaels, entertainment; Art Clementson, President of Chicago chapter, reception; Nick Downes, registration; Jack Shute, publicity, and Mrs. Hubert Rancour as chair lady of the ladies committee.

Tentatively the program includes registration and reception on Friday evening, April 29. On Saturday, April 30, registration will continue. Two educational papers will be presented at the morning session and two more following luncheon. At mid-afternoon there will be a selection of local downtown plants for short field trips. That evening the host chapter, Chicago, will sponsor a cocktail party and a dinner. Sunday morning is open and Sunday afternoon a chapter clinic will be featured, conducted by the national officers. Conference headquarters will be at the Congress Hotel.

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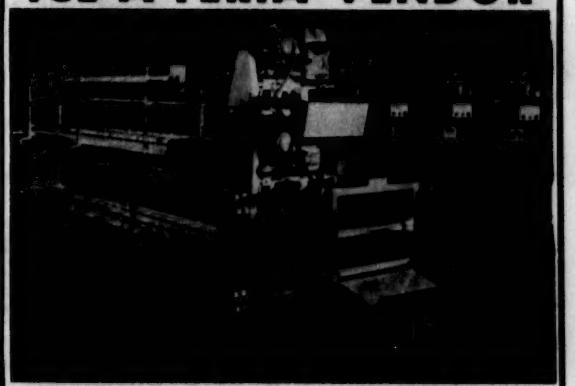

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From the President's Desk

Forthcoming Instruction Manual Described
Question Box Benefits Emphasized

FEBRUARY brings a new school term for our children or grandchildren, and even for those of us who still pursue phases of additional learning. Therefore, this month let's look into coming attractions and current features of our Educational Program.

For this year 1955, the Board of Directors decided that the best interests of our Association would be served if better and more consistent use of our text, *Basic Refrigeration* was obtained. To accomplish this objective, the Board commissioned Assistant Chairman of the Educational Committee and author of the Text, Guy R. King, to prepare a manual to help the instructor present the course to his class in an easily understood and interesting way.

The Board of Directors also provided that issuing of Certificates of Proficiency be revived. This certificate was formerly issued to any NAPRE member who successfully completed the then current course and who passed an examination as supplied by the National Educational Chairman. Examinations were given under the supervision of the Chapter President and Instructor. The new manual will assure universal application or use of our text, preparing all members who attend classes and/or study the course to take the exam on equal footing.

According to Guy R. King, the Manual will aid the Instructor in the following ways:

1. It will suggest points of discussion in each lesson, and methods of carrying on the discussion to bring out the desired information.

2. It will suggest possible experiments to illustrate important principles.

3. Given therein will be, chapter by chapter, a bibliography of written material available from manufacturers and other sources to help augment data in the Course.

4. Given where known to be available, will be a bibliography of slide films and movies for use as instructional aids.

5. The Manual will list manufacturers who have lecturers available to discuss application and service data, regarding their type of equipment.

Any instructor desiring additional information or help not in the manual or course, may write the Chairman, Educational Committee. Every attempt will be made to answer his particular needs. Guy R. King also requested that any instructor who has developed interesting new methods of presenting data in the course, to contribute it to the good of the Manual.

Chapters Urged to Use Monthly Question Sessions

Principal benefits that can be derived by NAPRE membership and the purposes for which NAPRE was established, lies in the use of the Question Box. Our new Educational Chairman, Prof. Harold P. Hayes, takes up the late Professor Venemann's theme: He urges a 20-minute minimum session at each chapter meeting on the Question Box.

It is therefore suggested that if a chapter does not have an actual Question Box, the Sgt.-at-Arms be instructed to obtain one which will be kept near the entrance to the meeting place. There members can deposit, with or without signature, their questions on problems or subjects with which they are having difficulty. This will provide a sort of anonymity for those more bashful members that would not care to bring their questions up from the floor.

Chapter Educational Program Chairmen should select the questions deposited each meeting. It has been suggested that the questions be read at one meeting and answered at the following, whether two weeks or one month later. The local chairman should attempt to answer all questions, drawing assistance from other local members. Those questions which "stump" or "stymie" your local committee can be referred to the National Educational Chairman.

The National Educational Committee is acquiring a backlog of questions. With 14 years of material to draw on, only a couple more years of activity should see sufficient material available for publication of a sort of blue book of questions and answers on refrigeration. Persistent use of this general educational feature on the part of the chapters, will determine the membership's interest in this type of proposed publication.

Educational Loan Fund Memorial Becomes Reality

An Educational Loan Fund was established by NAPRE Board of Directors and the 45th Convention. To be known as the Venemann Memorial Educational Fund, the intent of this trust is to establish a permanent fund from which loans to members and students may be made to further their technical education.

NAPRE's Board Chairman appointed the National President as Chairman of the special committee to draw up rules and regulations governing the use of the fund and the qualifications of the borrowers. The National Treasurer was appointed Trustee for the funds, and instructed to invest all donations in United States Savings Bonds.

With the general intent of the Memorial established, and the Trustee appointed, the Association is in a position to acquire funds immediately. Chapter officers will recall Past President Leo Vivien's suggestion at the time of our beloved Educational Chairman's departure, that floral remembrances, etc., be withheld in favor of a suitable memorial as suggested by his widow. Chapters, individual members and other interested persons are now invited to make their contributions. They should be made payable to NAPRE, Venemann Memorial Educational Fund, and mailed to our National Office. Leland Kenagy, our Treasurer and Trustee, has been instructed to publish quarterly reports on this fund.

Appointed to this special committee, in addition to the National President, who serves as Chairman, are Past Presidents Howard H. Peterson, Emmett T. Quinn, Angus Casberg, Addison E. Wegener, Kenneth M. Holaday and Louis P. Mantz. Ex-officio committee members are the National Secretary and the National Treasurer, The National Educational Chairman, and the Assistant Educational Chairman. It is the intention of the President to add the classification Honorary Committeemen and to list their names in the near future.

Regis Enbeer

More on Question 1028

Thermal Expansion Valve Fails Coil Extensions

QUESTION NO. 1028. An existing set of 2-in. pipe coils was increased by adding a set of 1½-inch coils below them. A 5-ton thermal expansion valve was installed leading into the 1½-in. coils. The 1½-in. coils are new pipe with welded tube turns on the ends, and they are cut into the 2-in. coils where the liquid line originally entered.

There are two identical set-ups like the above. One set worked fine for a while; then the bottom set would not frost over. It was believed that the power unit on the thermal valve had failed, so the hand expansion valve was used. When using the hand expansion valve, the bottom set would not frost over.

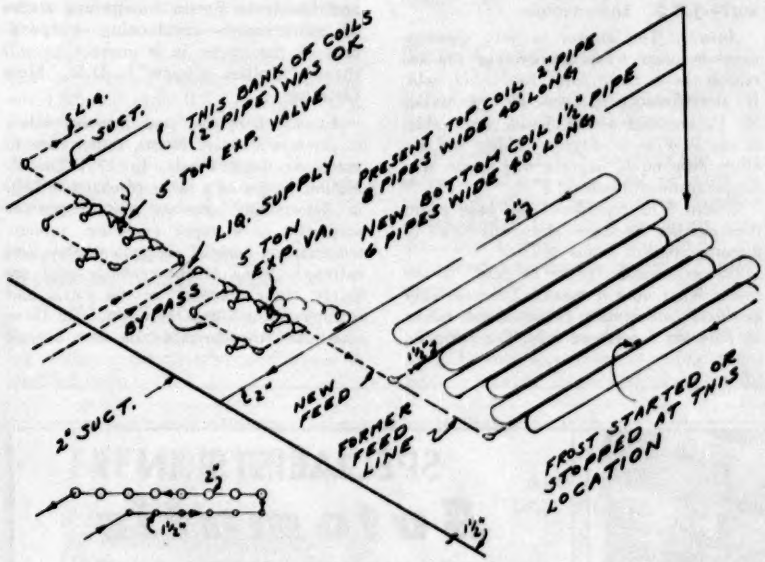
Enough liquor was then allowed to enter and the bottom set of coils frosted over, but the top set thawed. The hand expansion valve was again opened until both sets of coils frosted over; then the machine (9 x 9 in.) frosted over the cylinders, too. When the expansion valve was cut down to where there was no frost on the machine, one or the other set of coils would thaw and start dripping; the other set of coils operated satisfactorily. A new power unit for the thermal valve has been ordered. Is that the answer?—Henry Black, Texas.

(Editor's Note: This contributor forwarded his experience, following the question's appearance in the November, 1954 INDUSTRIAL REFRIGERATION. Unfortunately the sketch which helped clarify the problem, did not appear until December, 1954. Although O.L.B.'s answer does not specifically apply in this case, it does provide another very satisfactory and practical solution.)

NAPRE

Question Box

The National Educational Committee, NAPRE, answers monthly in this column, operating problems forwarded by members. The Committee appreciates answers from the field. Address questions and answers to Prof. Harold P. Hayes, Dean of Engineering, State Polytechnic College, San Luis Obispo, Calif.



Plan View Showing Layout of Pipe Coils

Answer: Regarding Mr. Black's problem of failure to get his newly installed lower evaporator coil to synchronize with an upper one, it appears that the trouble lies in the way the two outlets connect with the return line and the location of the feeler bulbs, rather than loss of charge in the power assembly or in the failure of the power charge to operate under proper conditions.

It appears from the description given that cold vapor inside the return pipe of the operating coil, perhaps with liquid particles entrained in it, flows back into the other coil and, by reducing the feeler bulb temperature prevents it from opening the thermoexpansion valve of the other coil. Connecting the outlets of both coils to the common return by goosenecks, as shown in the drawing, will eliminate this common failure of two coils to synchronize.

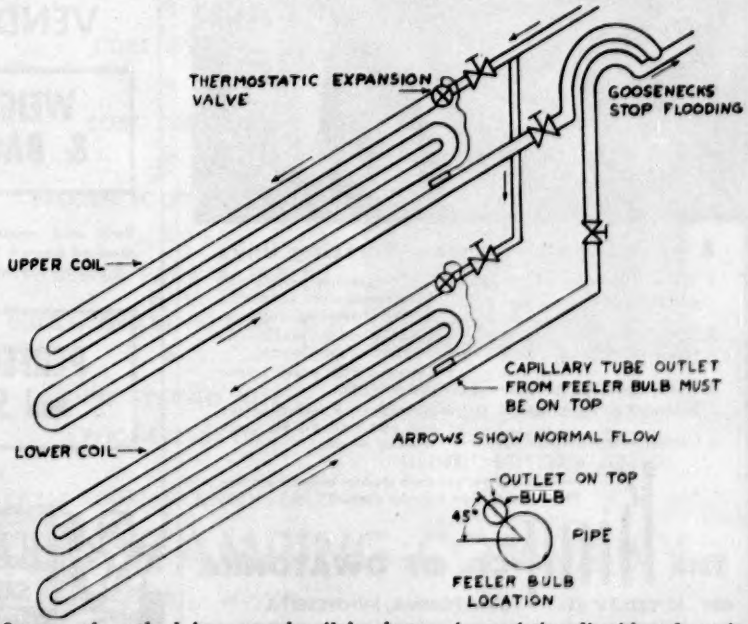
Another cause of failure to synchronize is the attempt to use two thermoexpansion valves with unlike power assembly charges. In ordering valves from a manufacturer, be sure to state room temperature, as well as valve capacity. This last is also important, as the capacity of a valve should be chosen for the amount of evaporating surface.

Finally, when a valve is installed, care should be taken to get good contact between feeler bulb and the pipe, and to make sure that the capillary tube between feeler bulb and diaphragm leaves the blub at the top.—O. L. B., Oroville, Wash.

More On Question 1029

Gauge Glass Coloring

QUESTION NO. 1029. On a large tank where we cool water for air cooling coils is a gauge glass for ammonia level. The ammonia suction lines are connected to the compressors and the feed lines come from the receivers.



Suggested method for second coil hookup, using existing liquid and suction

Now these receivers feed all other ammonia lines and all are interchangeable. The ammonia in receiver glasses has its normal color but that in the water cooler shows green. This glass is a boiler glass with a red stripe running up the length of it. Has this red stripe any bearing on the color or is it the structural qualities of the boiler glass that gives the ammonia a green color?—R. G. S., Buffalo.

Answer: The red stripe on the glass which R.G.S. mentions should not have any affect on the color of the refrigerant. This red line acts simply as a magnifier, helping the operator to determine the correct liquid level. — R.C.J., Henry Valve.

Odor Removal From Insulation Surfaces

QUESTION NO. 1034: We have a walk-in cooler here which has a bad odor due to meat spoilage over the years. It has cork walls exposed and we have tried everything, including baking soda, charcoal, airwick and so on. Do you have any suggestions along this line? The cork wall seems to have absorbed the odors and won't give them up.—C.B., Anchorage.

Answer: The question arises as to what is the best procedure: Shall it be fumigated by removing all products, or shall it be treated with the products left in the cooler? I do not believe that any treatment will eradicate the bad odor permanently, but an application of a solution of sodium hyperchloride by brush or spray to floors and walls will offset the bad odor which now prevails. It is comparatively inexpensive.—The Late H. G. Venemann.

Twice As Cold As?

QUESTION NO. 1035: Please permit a fellow member to ask a silly question. Silly in most respects, but we have a warm discussion about it in our service department, and the men don't elect to take my word for the answer. Let's see if you back me up!

Question: Outdoor temperature at 7 am is minus 10 F. At 10 am its twice as cold. How cold is it at 10 am?—J.E.S., Indianapolis.

Answer: The answer to your question depends upon what temperature you establish as a base point for being cold. If the freezing temperature of water, 32 F, considered the base point, then minus 10 F is 42 degrees colder, and another drop of 42 degrees will result in a temperature of minus 52 F.

If zero F is considered the base point, then another 10 degree drop will result in a temperature of minus 20 F.

The expression "twice as cold" is the catch. What does it mean? Twice as cold as what? Under many circumstances minus 10 F is not considered cold. For example, minus 10 F is warm enough to boil liqiud Freon or liquid ammonia exposed to atmospheric pressure. It is 450 degrees warmer than absolute zero, but would we dare say that it is 450 degrees hot?

Any expression such as "twice as cold," "twice as far," "twice as fast," "twice as high," "twice as pretty" must have some base point before the final result can be cooprehended. It must be "twice as pretty" must have some base point before the final result can be comprehended. It must be "twice as cold as something," or "twice as far as somewhere," etc.—The Late H. G. Venemann.

Correct Chart Titles

QUESTION NO. 1036: In using pressure-entropy charts to describe and illustrate Freon refrigerant states of compression—condensing—evaporation in the cycle, is it correct to call these "Mollier Charts"?—D.B., New Orleans.

Answer: I believe your question refers to *pressure-antholpy* charts, rather than to pressure-entropy charts. In 1904 Dr. R. Mollier published a series of charts to help in determining the six most important properties of a vapor (pressure, volume, temperature, internal energy, enthalpy, and entropy). Some of these charts used enthaply (heat content) as the y-axis and entropy as the x-axis. However, with these coordinates the charts do not show a good

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plot of the volume lines. Consequently Mollier developed other charts plotting *pressure versus* enthalpy.

Since Mollier was the first to develop both *types* of charts, his name is now usually associated with enthalpy-entropy and pressure-enthalpy charts. It is therefore correct to refer to pressure-enthalpy charts for Freon charts himself.—H.P.Hayes

Purger Relocation

QUESTION NO. 1037: Purging connections in my ice plant are "highly" inconveniently arranged, with the purger perched high up among some tall girders. I have a desire to relocate the purger in a more accessible situation. Would any complications arise if I brought it down closer to the receiver and the floor?—Dan Chapman, Texas.

Answer: If it is an Armstrong purger with a jacketed chamber, the location would affect it little. If it is a Hill purger, it should be located high enough above the receiver to *assure a positive head* to cause the condensed ammonia to drain freely by gravity from the purger of the receiver.—Angus Casberg, Texas.

Detecting Faulty Valve Regulating Water Supply

QUESTION NO. 1038: What is a simple way of determining when cooling water valve to my compressor is jammed open?

Last month my city water bill, normally about 30-35 dollars, jumped to 92. My refrigerator serviceman located the water valve failure, but hasn't offered any method of detecting failure in the future.—B.N., Indiana.

Answer No. 1: Make a daily habit of checking your water meter every morning. Any sudden jump in daily consumption would indicate trouble. Then check all your taps and compressor cooling water regulating valve.—J.R.K.

Answer No. 2: Apparently your system has a closed cooling water outlet from compressor to sewer, sump, etc. If possible, install a funnel in the outlet line where the discharge water can be seen. If the water continues to run after compressor shut down, its very evident that valve is open.—H.B.

New Questions

Efficient Method Sought For Cleaning Air Filters & Ducts

QUESTION NO. 1039: It has been some time now I've had to turn to you for help. Now I have another question and though it is on air conditioning I hope you can advise me or refer me to another source of information.

We have 10,000 air filters to clean and oil here, and wonder if you know of a better way than cleaning them with a steam hose and then oiling them. We seem to waste a lot of time and manpower. Do you know of any apparatus for cleaning more efficiently? The ulters are mostly 20" × 20" × 2", industrial type.

Also you might know of a better way to clean ductwork than with just a vacuum cleaner. Thanking you again for the help in the past and for any help or reference you can give me now.—C.B., Spenard, Alaska.

Seeks Experiences With Monochlorodifluoromethane

QUESTION NO. 1040: In our experiments with "Freon-22" we have been trying to find under what conditions lubricating oil separates out in either the suction or discharge line. While our investigation is far from complete, we have found little difficulty of this type. Could you give us field experience where difficulties of this type have been encountered and under what conditions?—N.S., San Luis Obispo, Calif.

Liquid Solenoid Headache Due to Valve or System?

QUESTION NO. 1041: We have liquid feed valves to our accumulators operated by floats which turn on electricity for operating solenoids. To be perfectly frank, these valves have not at all been satisfactory and cause about

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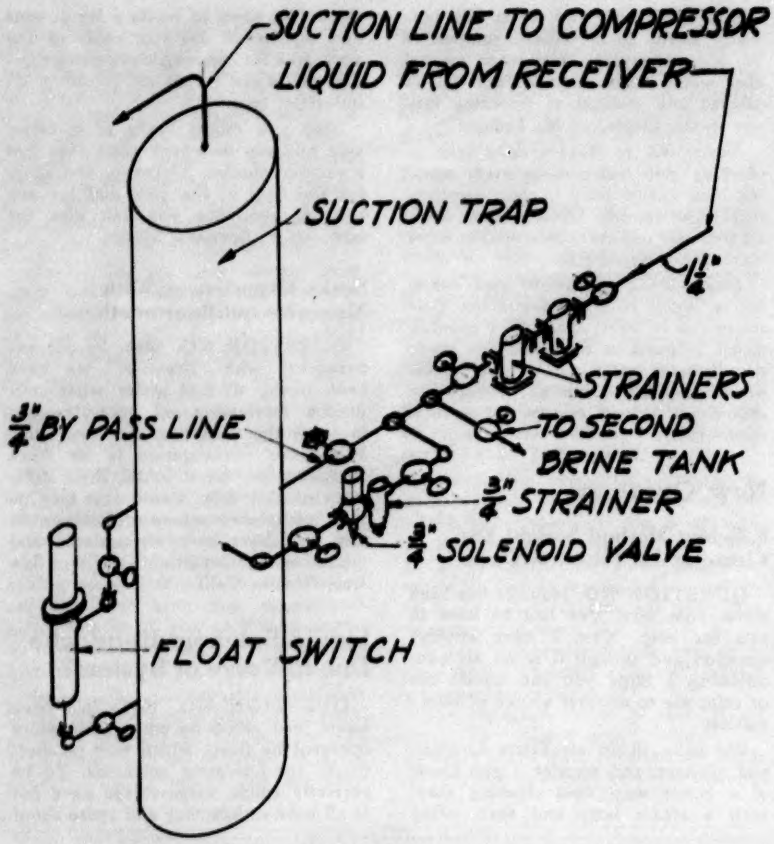

Liquid Line Arrangement for Ice Making Tank Accumulator.

90 percent of our difficulty in operating this plant. We have done everything that the factory recommends and still the valves will not work satisfactorily.

In our ice plant, we use a flooded system with coils in between each row of cans, all hooked on to an accumulator. When the pre-set level of ammonia in our system is lowered, a float valve raises and turns on the electric current. This in turn causes a solenoid valve to open and allow ammonia to pass into our system. The solenoid valve will either hang open or close, thus causing our brine system to be starved or flooded.

The main feeder line to the accumulator from the receiver is a 1-¼ inch. We have two strainers on this line, one a 2 inch and one 1-¼ inch. In addition we have a third strainer which is before the solenoid valve. The float valve never seems to give any trouble to speak of and almost always works perfectly.

I believe that the main thing causing the solenoid valve to hang open is foreign matter in the ammonia that passes through the strainer. Even though we have three strainers in our line, foreign matter simply gets into the system, and I do not know how to prevent it. We blow our coils and remove the oil from them as well as the accumulator. We do the same for the receiver and sometimes get long strings of waxy oil out of these.

We have had them in operation for nine ice seasons and have found that they take a great deal of care and watching. The main things we have learned are as follows:

The valve has a gasket in it. If you are not careful, this gasket will protrude enough to make plunger inside the valve hang on part of gasket and thus fail to open or fail to close; mostly fail to close, thus flooding your system. The plunger has some corners on it and we have found that by taking a small file and rounding off edges somewhat, makes the valve work a lot better. Third, we have added a little lead weight to the plunger thus making it a few ounces heavier. This makes it fall better and keeps it from hanging open. We have also put a thin washer in the barrel in which the plunger works, thus not allowing the plunger to raise as high. This also keeps it from hanging open which is our worst trouble.

When one does all this plus cleaning all strainers once a week, one can keep this valve working. My main objection is that is simply is too delicate to be practical and causes too much trouble and requires too much time with its continual requirement for a watchmaker's care and servicing. —C.A.M., New Mexico

McKenna Addresses Chicago Section ASRE

ELECTRONIC controls was the subject of discussion by James S. Locke, sales manager, Minneapolis Honeywell Regulator Co., Commercial Division, at the December meeting of the Chicago Section ASRE. The speaker explained the application of the electronic system to various controls within air conditioning systems. Following his discussion he answered questions from the floor pertaining to use of electronic systems in refrigeration applications other than air conditioning.

The engineering service committee, meeting prior to the regular section meeting, was led in a discussion of cooler conversion to freezer storages by Bert C. McKenna, chief engineer, Central Cold Storage Company, Chicago. Mr. McKenna, a member of the ASRE-AMI joint meat board, and a vice-president of NAPRE, described the conversion of 32 cooler rooms at Central's main plant. The discussion not only covered selection of evaporative surface for the changeover, but also included insulation replacement, finishes, and changing of cold storage doors.

Cast aluminum circular fin pipe coil, placed over the storage room aisles had been selected by Mr. McKenna's firm. He pointed out that this had been preferred over diffuser or blower type evaporators because of the brine system employed in the building. He estimated horsepower required for blower units would have been approximately equivalent to the horsepower now consumed in the main refrigerating plant. It is felt that the additional operating cost was thereby avoided in making the installation of the fin type overhead coils.

Dairy Support Continued

CURRENT dollars-and-cents support prices for manufacturing milk and butterfat and current buying prices for butter, cheddar cheese, and nonfat dry milk will be continued through the 1955-56 dairy marketing year which begins on April 1, says an announcement by Secretary of Agriculture, Ezra Taft Benson.

The support prices are being continued at $3.15 per hundredweight for manufacturing milk and 56.2 cents per pound for butterfat. These are an estimated 80 percent of the modernized parity equivalent price for manufacturing milk and 77 percent of the parity price for butterfat, both as of early 1955.

News Notes and Chapter Activities

Los Angeles

FRED HERR

A SPAGHETTI-and-meat-balls dinner was arranged by Ed L. Nelson, chairman Entertainment Committee January 5 at the Terminal Club, to get the chapter's 1955 meeting schedule off in proper style. The new president, Elmer A. Johnson, called the business session to order at 8:00 p.m. First order was the presentation by National President, Regis Gubser, of a past-president's pin to Frank Eccleston, 1954 head of the chapter.

Johnson presided at the induction of nine new members. These were: James E. Duffy and L. W. Lease, Pac. Tel. & Tel. Co.; Ted Westland, A. E. Simon and James W. Stillwell, Union Ice Co.; Phillip Morasco, California Consumers Corp.; Hirosbio Wakusagana and Ralph Corbin, Ralph E. Mannus Co. and W. E. Thompson, Pacific Fruit Express. A report by Frank G. Muzzy, membership committee, revealed the chapter to have accounted for 28 new members as of January 5.

Larry H. Benedict, chairman, educational committee, reported subjects definitely decided upon for the dates indicated; January 19, Refrigeration—Old and New; February 2, Special Applications of Thermo-Expansion Valves; February 16, tour of new Budweiser brewery; March 2, Digest of Outstanding Engineering Articles; March 16, High-Speed Compressors; April 4, Electrical Problems in Refrigeration Industry; April 20, History and Trends in Air Conditioning and Refrigeration; May 1, plant visit to Recold Corp.; May 28, Science Talk, to be arranged by Ed L. Nelson; June 2, Cool-

Snaps from Los Angeles "Ham 'n' Beans" feed, Sept. 15. Top left: Don Byl and W. B. O'Connor at the door; top right: a dinner table group; lower left: past-prexy Herb Royden, entertaining his table companions; lower right: Knus Jorgensen, Henry Hawkins, Pres. Frank Eccleston, and another past-pres., Frank Elliott.

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ing Plants; June 15, Old-Timers Night and Ladies Night; September 14, Ham-and-Beans dinner; October 5, plant visit to local ammonia plant; October 19, Corrosion Control in Refrigeration Plants.

No chapter meetings have been scheduled for November in order to allow the members to concentrate on the national NAPRE convention to be held in Los Angeles, November 8, 9 and 10. The night of December 7 has been set aside for election of officers.

Entertainment program, Jan. 5, consisted of two motion pictures; "A Letter to a Pilot" and a sports film, "Fabulous Fishing in South America".

Seattle

JOHN GRAINER

Brewery evaporators and condensers were topics of a general discussion by M. E. Bell, member, and the Supervising Engineer, Sicks' Enterprises, Seattle, on January 4. Mr.. Bell had no written lecture, but drew on his practice and experience over the years in which he has been engaged in this field of engineering. Three types of evaporators commonly used in breweries were mentioned: namely, the submerged coil, the submerged brine cooler, and the shell-and-tube type, it being his opinion that the shell-and-tube was the most successful.

The refrigerant mostly used according to Bell is NH_3, with brine as a cooling medium. It is Sicks' practice to use a closed brine system, with brine at 20 F. In practice, the major load is the wort cooling, and this being almost half the total cooling load. Pros and cons of these evaporators were discussed, as well as the various cooling mediums. Use of plate cooling for wort, and the need of a low pressure differential between wort and the brine was brought out. Baudelot coolers and water as a cooling medium were also discussed.

Cooling fermented beer was also dealt with by Bro. Bell, this being done by either NH_3, or brine cooling. Where NH_3 is used, it is common practice to employ the flooded coil system. Necessity for humidity control and the prevention of bacteria growth by means of temperature and pressure control were discussed. Methods of cooling cellars and beer storage by the equal distribution of controlled air, and the various temperatures at which crowns, labels, bottled and barrelled beer were stored were covered.

Condensers in use in breweries were touched on lightly by the speaker. It was his opinion that the atmospheric type of condenser is the most efficient and is the type most commonly used in breweries. A number of pertinent questions were put to the speaker by the members present both during and at the close of the lecture all of which added to the general interest.

Installation of officers took place at this meeting. President Frank Knowles appointed the following committee chairmen: Robert S. Harrison, Educational; Lauren L. Bair, Membership; Howard F. Penoir, Entertainment; and Mervin S. Schmitz, Telephone Committees.

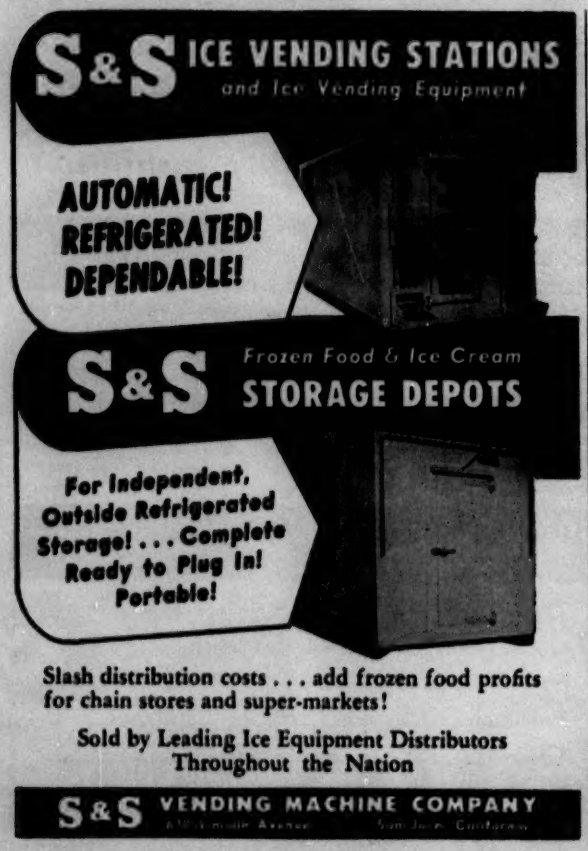
Ways and means of increasing the present attendance at meetings were discussed. It was decided to canvas the members as to change of meeting dates. Members were in favor of discontinuing the present dinner arrangement before meetings. Howard F. Penoir, Chief Engineer, and William Silk, Operating Engineer, Sicks' Seattle Brewery, were voted in as active members.

Texas Coastal Bend

VERNON KUMMEL

PRINCIPLE events of our December meeting was the report of Ed. Campbell our delegate to the National Convention in New Orleans. In the absence of R. A. O'Neill and Dan Miller, President and Vice- President, the meeting was called to order by V. M. Kummel, Secretary.

A cocktail hour preceded the Christmas dinner party on December 13, at the Corpus Christi Engineers' Club. President O'Neill presented lapel pins to each member present at the conclusion of the dinner. Mrs. Dan Miller played the piano and everyone enjoyed singing Christmas Carols. Glen Greene, Comptroller, Southeastern Public Service Company, New York, was a guest.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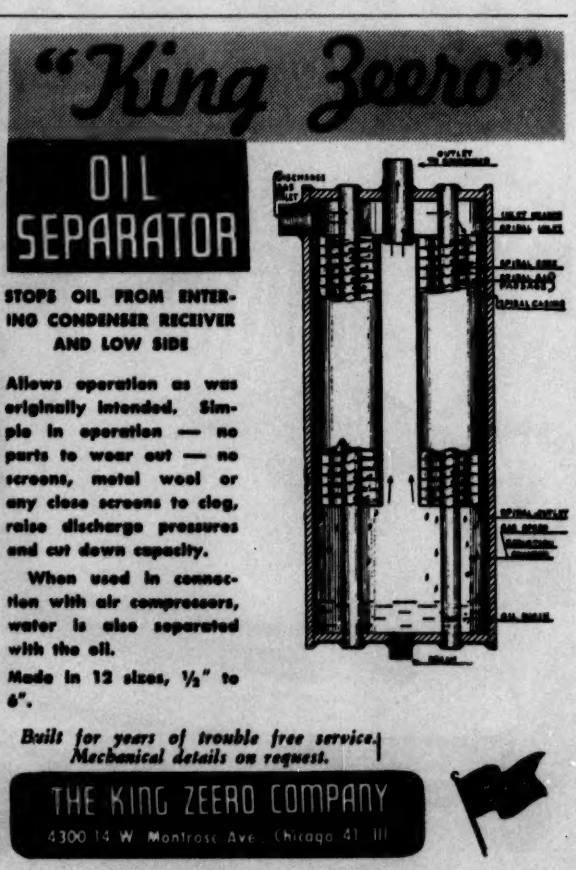
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Members-at-Large

BERT C. MCKENNA

MEMBERS in this category are usually the most prompt with their annual dues obligations, according to our national secretary. Among some of the earliest heard from were J. Bruce Espy, City Ice Company, Denver; Herman J. Duke, Refrigeration and Air Conditioning, Richmond; William H. Burton, Baltimore, Maryland and Otto J. Nussbaum, chief engineer, Kramer Trenton Company, Trenton, New Jersey. Incidentally, we understand that Mr. Nussbaum has an article under preparation for our official organ INDUSTRIAL REFRIGERATION. We will be looking forward to seeing his paper.

Other members heard from in December, with their remittances, were Walter F. DeHoust, Butler Warehouses, Inc., Brooklyn, N. Y.; Clarence Broeker, Youngstown Cold Storage Company, New York; J. Henry Gross, chief engineer and building superintendent, Sheraton-Belvidere Hotel, Baltimore, Maryland, and William Brownlow, Quaker Cold Storage Co., Philadelphia. From Lancaster, Pennsylvania, came word from Augustus L. Rineer, Lancaster Ice; also Carl Danz with the Cedar Point Coop in Granville, Illinois. Way out in Waynoka, Oklahoma, Fletcher Kysar's remittance battled Christmas mails and made the national office before the end of the year. Fletcher is with Railways Ice & Service Company. And from apple country, we heard from H. Aveldson, with Omak Fruit Growers, Washington.

It was like renewing old acquaintances to see correspondence from John Muller, Railways Ice & Service Company, Kansas City, and Walter Brittain, Crystal Ice Company, Ardmore, Oklahoma. We had the pleasure of getting acquainted with both of these gentlemen at our national convention. Charles F. Belew, chief engineer for Grand Hotel Development Corp., Point Clear, Alabama, not only remitted, but expressed his disappointment at not being able to attend the convention at New Orleans last November. However, he was welcoming his first son into the world at that time. Congratulations, Chuck. Missed at this year's convention was Telbert Cutting, Fairmont Canning Co., Winnebago, Minn. We did hear from brother Cutting during the Christmas holidays.

George T. Crawshaw, refrigeration engineer for the Hamilton City Council, Ontario, Canada, writes: "Herewith please find my eight dollars for 1955. With all good wishes and the seasons blessings for the coming year. I was very sorry to hear of the demise of our worthy Professor; although late, please accept my heartfelt sympathy for the family bereavements." Another Canadian member residing in Ontario, who renewed his membership for another year, is George O. Paterson, Arctic Ice Company, Brantford, Ontario.

Even members abroad qualified for the "eager beaver department." They are Leslie E. Steggel, Lightfoot Refrigeration Company, Upminster, Essex, England; Maurice E. Anderson, J. & E. Hall, Ltd., London; and H. Augustin Reed, Fabrica De Hield Gomez Palacio, S.A.

Chicago

BILL O'REILLY

LAST meeting of the year consisted of another one of Bert McKenna's fine dinners, held in the Inspection Room, Central Cold Storage Company, where Bert "resides" as Chief Engineer and Chief Cook also. Thanks to Bert, everyone enjoyed a fine meal and had plenty to eat.

After dinner the regular meeting was officially brought to order by President Art Clementson. Six new applications were read and accepted. Bert McKenna, National Vice-President, presented J. R. Watson, Ideal Electric & Mfg. Co., and Mr. H. T. McDermott, Editor and Publisher, Industrial Refrigeration, National Honorary Identification Cards and Certificates. After the presentation both responded with very nice appreciation speeches. Members then rose and gave them a standing ovation which they so richly deserved.

Dick Kelahan, National Secretary then initiated all new members. John Neff, National Past-President, a National Honorary Member himself, gave the new members the obligation. President Clementson and Bill Tiffin, Secretary, gave them their pins, data books and certificates, making them official members. Bert McKenna then invited anyone who had not gone through the plant, or anyone who wished to go through again, to do so. Forty members accepted.

Chapter Past President Lloyd E. Beard went to a lot of trouble to get home for Christmas. Bill Cody reported Lloyd in the hospital, where coincidence had brought them together. Lloyd had been flown back to Chicago from Montreal where he was constructing a new plant for his employer, Kraft Foods. Both Bill and Lloyd were in for emergency hernia operations from which they are convalescing.

San Francisco

LEWIS BROOKS

DOUBLE feature in the speaker's program continued to be the order of the month at the December 10 meeting. Defrosting refrigerated railway cars was the topic of a short discussion by Leroy Etzel, national vice-president and member of this chapter. Leroy was followed on the program by Al Ballard, who led a discussion on hot gas defrosting. These 30 to 45 minute pointed discussions seemed to be proving quite effective, from both an educational and an attendance point of view. In November the Chapter toured Sutro's 110-ton brine plant for their new figure skating rink.

New officers elected at the December meeting are President, Howard E. Boudreau, Cyclops; 1st Vice-president, Henry A. Guilmette, Pacific Scientific Co.; 2nd Vice-president, Charles T. Stewart, Foremost Dairies, Inc. (Golden State Co. Div.); Treasurer, Al. Ballard, R. B. Holland Co.

A new member, John A. Dow, North Sacramento, representative for Mojonnier Bros. Inc., was elected. The members present were informed of the recent death of R. J. Bailey and paid their usual respects standing in a moment of silence. Brother Bailey was an associate member, having joined on March 3, 1943 and was president of the Union Ice Company.

Rio Grande Valley

ARMIN DONEIS

QUESTION Box period on December 7, was presided over by G. C. Musch who discussed at length the problems involved in starting large direct connected, synchronous motor-driven ammonia compressors. It was emphasized that faulty valves are often responsible for difficulty in getting such motors to pull into step, and there have been cases where the motor would scarcely start at all from standstill as a result of bad valves. Piston slap was another item brought up for discussion. It was suggested that this can be successfully eliminated by reversing direction of rotation of the compressor, after first having reversed the operation of the direct connected oil pump.

In order to lighten the load for instructor Doneis, Dan Chapman took over the technical session which dealt with the boiling of liquids. The discussion was intended to answer the question, "Does a liquid have its temperature raised above boiling point in order for it to boil vigorously?" A lively discussion ensued during which the conditions and definitions were clarified, and it was then agreed by all that the temperature does not and cannot rise above the boiling point at any pressure until the very last drop of liquid has evaporated.

Christmas Party of Rio Grande Valley Chapter was held on December 21. Members and friends met in the chapter clubroom in LaFeria to enjoy a delicious buffet supper and informal social gathering. Peggy Doneis, daughter of the secretary pleased the audience with two ballet dances. Angus Casberg sketched briefly the historical background of the NAPRE, and the circumstances which led to its formation. Armin Doneis told about the establishment of the Rio Grande Valley Chapter in 1947 and described the early activities of the Valley Chapter, and read the names of the charter members. He mentioned the names Casberg, Muller, Bowie and Woolrich as being among those most instrumental in its initial step toward formation, its early success, and progress of the chapter through the intervening seven years.

Dan Chapman told the gathering that the need for an organization such as NAPRE is as great as ever. He anticipated that our chapter would contiue to severe its members and the industry well, and urged everyone to bring our organization to the attention of persons who stand likely to benefit from our work and from association with us. Jim Sweeney of San Benito, one of the honored guests, expressed his satisfaction in the good work of NAPRE, and his pleasure over our continuing activity and success.

Milwaukee

"ANDY" ANDERSON

MILWAUKEE Chapter held its meeting November 24 at the Milwaukee School of Engineering. The educational session was held at 7:00 p.m. with 19 men present. Vincent Noll was the instructor. The start of the educational session was a movie on thermodynamics. Chapters 1 and 2 were reviewed. The regular meeting convened at 8:00 with John Alberte as acting program chairman. A movie on anhydrous ammonia was handled by Jack Pendorf, Armour & Co., followed by a film on Liquid Air.

On December 21, the educational session again had Vincent Noll as instructor. A film on basic refrigeration was shown. Chapter No. 3 was reviewed. The regular meeting convened at 8:15 p.m. A motion was made and passed that the secretary contact headquarters and request that the charter be presented at our March meeting. This meeting would be held on March 23, 1955. A motion was made and passed that the President appoint a committee to arrange for the meeting place and make the necessary arrangements for the persons attending. All chapters in the vicinity are invited to participate.

Lon Yates and Mr. Hamilton, both of Falfurrias, having driven 70 miles to be with us on this festive occasion, told of their pleasure in the social gatherings of our chapter and stressed the point that the congenial fellowship and good food (always a feature of our parties) was well worth the 140 mile roundtrip. Altho our former instructor, John G. Muller, was no longer with us having been transferred to Kansas City, he was nevertheless represented through his generous gift of a large basket of delicious apples which he had shipped down for the occasion, and which were eagerly shared by all present. In response, a joint card of season's greetings was signed by all, to express our appreciation of John's gift and all his earlier kindnesses and services to the chapter.

Dallas

GEO. E. STEWART

ON December 7, the Dallas Chapter enjoyed a hot-dog and chili supper at D. F. Bancock Maintenance Co. The president, D. F. Bancock, Sr., a member, gave the supper for the local NAPRE and NAPE Chapters. The plant tour by attendants was interesting, especially first hand inspection of all the machinery and some of the work that Bancock was doing.

The meeting on January 3, was held at Alford's Refrigerated Warehouses. New officers were elected: Pres., William F. Graham, Alford's Refrigerated Warehouses; Vice-Pres., R. R. Tribble, Proctor & Gamble Mfg. Co.; Secy., Harold A. Koutnik, Alford's Refrigerated Warehouses; Treas., E. J. Bennett, Southern Properties, Inc.; and Sgt.-at-Arms, James V. Glover, Hinckley Ice & Cold Storage.

After election, Elliott Hallowell conducted the refrigeration course briefly covering air conditioning, illustrating cost and type of unit for churches. Plans for future lessons were discussed, so that the new officers may move with full steam ahead.

Green Bay

JIM SCHOUTEN

THE meeting December 15, was called to order by President Les Winkler. Harvey Wishart, program chairman, introduced Tom Hughey of Minneapolis, who spoke on two stages refrigeration and booster compressors. After the speaker, first order of business was the election of officers. New officers are: Bert Bodart, President; Al Petcka, Vice-president: Jim Schouten, Secretary; Verne Zimmer, Treasurer; Gene Bruggink, Sgt.-at-Arms and one new Director, Jim Whitehouse.

Harvey Wishart reported that progress was being made in arranging for an instructor to begin the first of the year. Agreement was also reached that the meeting night should be changed to Thursday night, to accommodate the instructor's schedule. We finished off the educational session on the refrigeration course under guidance of Bert Bodart.

President Winkler handed the gavel to Bert Bodart for the coming year and congratulated all the officers. At this point a motion was made that a rising vote of thanks be given to Lester Winkler who handled the presidency so well after inheriting it from the first elected president who unavoidably left the industry last December.

New Orleans

LEO VIVIEN

LOUISIANA Chapter No. 2 regrets to report the death of one of its newer members. John L. Ross joined Louisiana Chapter in August and was very much interested in the ideals of the Association. He actively participated in our recent convention. His fellow engineers at the Touro Infirmary and the members of our chapter to whom he was highly esteemed are saddened by his death. He was a fine engineer and gentleman.

Detroit

LEO GAGE

MICHIGAN Chapter No. 1 held its annual Christmas dinner party and installation of new officers on Tuesday, December 21, at Carson's Chop House. The affair was enjoyed by an exceptionally large number of members, their wives and guests. Immediately after the dinner, the new officers were installed. They are: President, Charles M. Heemstra; Vice Presidents, Leonard V. Bedard and Walter Arndt; Secretary-Treasurer, L. L. Adams; and Sergeant-at-Arms, Melvin A. Larsen.

Outgoing President, Roy T. Burns, presented Burt C. White with an Honorary Life Membership Scroll, which award was voted at the National Convention held in New Orleans last November, in recognition of his hard work and loyalty to the Michigan Chapter and activities in the National Association over the past 32 years. The balance of the evening was spent with entertainment, including several sound Travelog movies presented through the courtesy of the American Airlines. All the ladies present received a special gift. There was also 42 door prizes, which included turkeys and many other holiday delicacies.

Fig 1. (top left) Past Chapter President and National Director Roy T. Burns presents National Honorary Membership Scroll to Burt C. White. (Left to right) Chapter President, Charles M. Heemstra, Roy T. Burns, Burt C. White. Fig. 2. (top Right) Speakers' Table, Michigan Chapter. NAPRE Annual Christmas Dinner Party. Fig. 3. (lower left) Retiring Chapter President Roy T. Burns receiving gift presented by membership in appreciation of his leadership in that office for the past two years. Fig. 4 (lower right) member William Euth and wife enjoy the party atmosphere.

Stockton-Modesto

HARRY DYER

IN SPITE of proximity of Christmas, our regular December meeting was held with good attendance on December 22. Discussed in the educational program were heat calculations, covering design temperature, conductivity of various materials, K factors and usage.

Election of officers was held at the December meeting. Elected for 1955 were: President, M. L. Holland; Vice-president, James H. Caylor; Secretary-Treasurer, H. C. Dyer; Sgt-at-Arms, Stockton, D. B. Desjardins, Sgt.-at-Arms, Modesto, Ted Hornbacker. The educational committee is: C. C. Berkley, Guy Vancleave, Ed. Bolin, Jay Jackson, Waino Menkkinen, and refreshment committee, D. B. Desjardins and Wm. Tordsen.

Memphis

CHAS. CONLEY

HOLIDAY spirit prevailed at the December 15 meeting, and usual business, education, etc. was set aside. Through the cooperation of Mr. John Thrithart, field engineer, General Electric Company, two color talking motion pictures were shown; one "A for Atom", the other "The Atom Goes to Sea". The first was an explanation of what an Atom was, and how it acted. "The Atom Goes to Sea" picture showed one of the very latest submarines in action, powered by Atoms.

January 5 meeting was a business meeting. The chapter's new officers for 1955 were installed with a very commendatory ceremonial. Past National President, Alvis J. Clay, read appropriate portions of the association by-laws to the group, telling each officer what the duties of his office are and what is expected of him, and wishing each one a most successful term of office. Past President Clay then presented Chas. A. Conley with a certificate of Honorary Membership in the National Association, which had been voted Conley by the Board of Directors on November 5.

A Chapter Honorary Membership was then voted Past President Clay, as he has served as Chairman, Educational Committee, for several years and had served in all the offices of the Chapter with the exception of Secretary. Carter G. Broaddus, Ass't. Engr. Humko Co., was elected to membership. At the close of the meeting, the group was turned loose to a dutch lunch and refreshments.

James S. Spaulding

JAMES S. SPAULDING, national past president, NAPRE, passed away Thursday, December 30, at Methodist Hospital, Memphis. Uncle Jim, as he was affectionately known, died of complications following a hip fracture on December 6. He was 72 years of age.

Chief Engineer of Nonconah plant of Railways Ice & Service Company at Memphis, Jim Spaulding had served that firm continuously for 47 years. He had been a member of NAPRE since 1921, and served as National President for the 1930-31 term. He had made his home in Memphis since 1915. He was a founder of the Andrews Memorial Methodist Church, which conducted the funeral services. Masonic services were conducted at the cemetery.

James S. Spaulding

NAPRE was represented officially at the service by honorary member and past president, Charles A. Conley and past president Alvis J. Clay. According to Conley, past president Spaulding was as great a man in the section he lived, as he was to those members of NAPRE who knew him.

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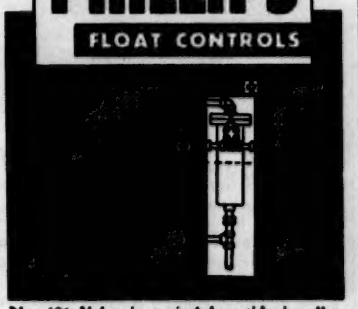

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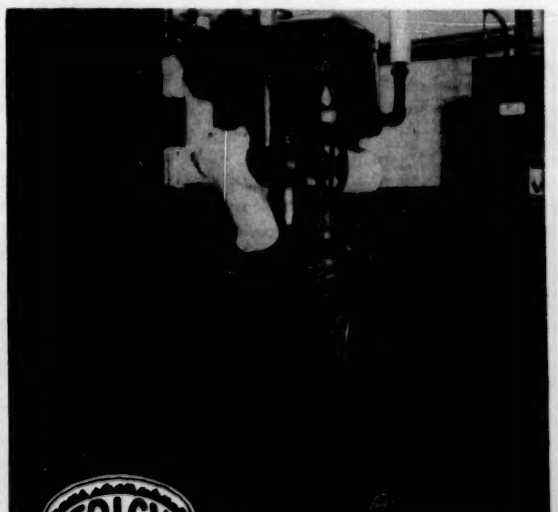

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Delta States Holds Annual Convention

THE general spirit of optimism that prevailed at the Biloxi Convention of the Delta States Ice Association December 5 to 7 was a big factor in making it one of the best in recent years. Attendance was well above expectations and great interest was evidenced in the merchandise and new equipment exhibited by associate members.

President N. A. M. Jackson in calling the convention to order gave a brief resume of the association's activities during the year. He also reaffirmed his belief that an active association, with an up-to-date merchandising program, played a large part in helping ice manufacturers solve their present day problems.

Mississippi Senator Hermes Gautier, also a veteran ice manufacturer of Pascagoula, Miss. discoursed most interestingly on the growth of the ice industry in the South over the past quarter century. The problems surmounted have been many and varied but he stated that worthwhile progress was expedited by banding ice manufacturers into associations.

Louis Nettleship of New Orleans, for many years associated with Frick Company, talked on automatic controls and latest gadgets. Eminently qualified to discuss this important subject, he further enhanced it by the use of slides. He showed in detail the remarkable progress that has been effected in automatic controls to reduce labor cost per ton and minimize errors in human control.

"Safety and Humor", by Justin Wilson, safety expert from Baton Rouge, La., was a unique message on this all important subject. Mr. Wilson, a speaker of great note, is renowned for his humor and inexhaustible supply of Cajun dialect stories. By expert handling he got across to his audience the gigantic cost in human suffering, man hours lost and money resulting from carelessness and ignorance.

Guy W. Jacobs executive secretary of NAII, in his inimitable way, charted the activities of the National Ice Association and its achievements in promoting the welfare of the industry.

Harry G. Frazer, C. P. A. of Monroe, La. gave an enlightening dissertation on income tax and accounting problems. He told of some of the important changes in tax laws that will face taxpayers in 1955. Utilization of this knowledge can mean considerable saving, in particular to the small ice plant operators, who do not employ a tax expert.

David J. Copeland, Vice-President, American Service Company, Atlanta, Ga., enthusiastically and dynamically discoursed on merchandising. From first hand experience, he told of the various methods used in merchandising, in addition to the public relations and advertising programs being utilized.

Clayton Rand, editor, author, traveler and speaker, gave an interesting general talk.

Officers for 1955 were elected as follows:

President, E. F. Hutson, Houston, Miss.

First vice-president, Alden Baker, Harrisburg, Ark.

Second vice-president, W. S. Moss, Baton Rouge, La.

Treasurer, G. Thomas Frazer, Monroe, La.

Regal Model 25

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FOR PLATFORM SACKING OR PAPER BAGS OR GENERAL USE

New all steel frame, legs, gate handle and grate. Self aligning ball bearings. Legs high enough for 25-lb. paper bag to be filled. Galvanized for the prevention of rust. ¾ HP. motor. Direct drive, no gears. Shelf for placing ice on before entering hopper. Slant hopper for easy loading. Hopper opening 12" x 10⅛". Speed of grinding is determined by grate setting. Four grate adjustments by turning the handle on side of crusher. Makes a very good fine ice on grate closed. Will take long 50-lb. blocks in hopper. Two belts for sure pulling power. Belts and motor pulley furnished when crusher is ordered without motor. Guard covers the flywheel and motor pulley.

Price .. $149.00, less motor. (Motor at prevailing price.) Shipping Weight 190 lbs.

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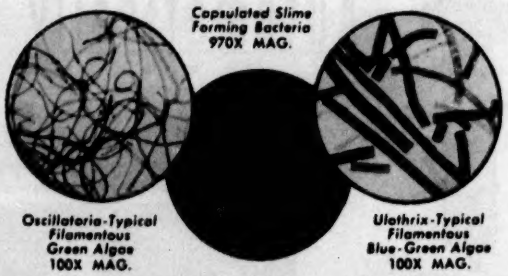
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In these photographs you probably won't recognize the culprit in your water that may be giving you trouble. No one would expect you to. After all, water conditioning problems are individual, requiring individual analysis, individual solution. This is the Wright Service: A laboratory analysis is made—a written proposal gives recommendations for solution—then frequent checks are made to assure continued efficient performance. Let us recognize your water conditioning problem and solve it for you. Write or call for a thorough survey by a Wright Field Engineer.

HAVE YOU TRIED WRIGHT'S NEW FUEL OIL CONDITIONER? Here's a new Wright development that eliminates sludge in oil storage tanks . . . keeps screens and burners clean . . . insures maximum combustion efficiency. Write for complete details TODAY!

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WRIGHT CHEMICAL CORPORATION

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• Softeners, Filters and other external Treating Equipment

• Nelson Chemical Proportioning Pumps

Refrigerated Warehousing Industry Holds National Training Conference

RECENT technical and research developments in the storage and handling of perishable foods were discussed at a four-day Refrigerated Warehouse Industry National Training Conference, opening Monday, January 10, at the Edgewater Beach Hotel, Chicago, Ill.

The conference, which was attended by over one hundred refrigerated warehouse operating personnel from all sections of the nation, was sponsored by the National Association of Refrigerated Warehouses and The Refrigeration Research Foundation.

Primary purpose of the Conference was to bring warehouse operating personnel up-to-date on recent technical developments and new operating techniques that will enable them to adapt their facilities and methods of operation to meet changing condition. Emphasis was placed on problems that are new and pressing in this present era of expanding volume of frozen foods and other perishable foods products.

A very valuable part of the conference were the round table discussions held Tuesday, Wednesday afternoon and Thursday afternoon, at which subjects presented at the previous session were discussed informally with the discussion leaders.

Safety

Safety, according to A. R. Carstensen, Sacramento, Calif. is one of the most important, but sometimes the most neglected, function of business management. He pointed out that the refrigerated warehouse industry's frequency rate dropped from 38.85 in 1952 to 36.94 in 1953; And the severity rate dropped from 1,840 in 1952 to 1.378 in 1953. But the All Industry frequency average was 8.40 in 1952 and 7.44 in 1953; and the severity average was .88 and .83. This record he said is a disgrace to any industry and shows that something must be done about it. He pointed out the reasons for safety work such as reducing costs of accidents, the humanitarian aspect, and lowered insurance rates. He then presented a method of setting up a safety program, followed by slides and a specially prepared safety movie.

Mechanized handling, with particular reference to layouts of single story and modern multi-story refrigerated warehouses was discussed in an interesting paper by Arthur Weyhe, Merchants Refrigerating Company, New York City. Materials handling in such warehouses, he said, are quite different from the old multi-story warehouses because they were designed for full use of fork trucks which provides for efficient moving or produce with greatly reduced labor costs. In modern multi-story houses, he said, there is a trend toward use of automatic elevators. Following his paper, Mr. Weyhe showed a number of pictures illustrating modern methods of using fork trucks.

Materials handling in the older multi-story houses was discussed by L. M. Ashenbrenner of Toledo. Mr. Ashenbrenner pointed out that when speaking of the older multi-story houses it usually means a building 25 to 50 years old. The building operated by his company was built in 1927 and at considerable cost it was remodeled to accommodate use of fork trucks. The first thing in a job of this sort, he said, is to analyze the floor area and the elevators. For efficient operation of fork trucks there must be sufficient area, door openings must be of proper width and elevators must have the required capacity. Each house, however, has a different problem, based chiefly on the layout. In this operation uniform sized pallets are used, all 36 x 48 inches. Interchange of pallets is a problem which calls for more uniformity between other warehouses and customers. Mr. Ashenbrenner also augmented his talk with a number of pictures showing pallet operations in his warehouse.

Employee Relations

Employee relations was presented in a dramatic discussion by William Levy, Executive Director, Management Development Division, National Association of Foremen. The art of management, he said, rests on the fundamental fact that each person is different and appeal to each must be made on a different basis. People, he said, have basic desires and wants and this explains in large part their actions. One of the big basic desires is to have a job and to be in an environment he can understand. Sources of friction among a large group of people, he said, should be carefully analyzed and the reason for this friction ascertained and remedied.

Public Relations was discussed by S. B. Shapiro of the Linen Supply Associations. The essence of good public relation, he said, is to create a favorable impression on the part of others. Workers can be a big help in this by circulating a good opinion of the company they work for. To encourage this attitude they should have a background of information regarding the company, its products and services, the customers it serves, etc. For the most part information, for instance in newspaper publicity, may consist of little things but the aggregate of many little things can grow into worthwhile publicity. He suggested a good publicity move would be to write local newspaper representatives and home economic classes to visit the plant occasionally.

Storage of Meats was presented by T. E. Evans, United States Cold Storage Corporation. Mr. Evans said freezing and storage of meats was started about 75 years ago. Since then new tecniques have come into use, particularly in the freezing of meats, which has greatly changed the situation. The success of this industry particularly, he said, depends upon the conscientious following through of good warehouse practices within the requisite information and the only thing necessary is to understand and comply with that information. Following his paper, Mr. Evans showed a number of slides illustrating the different methods of freezing of meat.

Sanitization

Warehouse sanitization was presented in a discussion by Prof. M. E. Parker, Department of Food Technology, Illinois Institute of Technology. Mr. Parker said that to sanitize means to sterilize equipment and all elements of the room in which products are stored. It results from the effective use of cleaning agents, the most effective of which are detergents, used to clean any material and leave the cleaned surfaces completely sterile. Although "elbow grease" cannot be entirely eliminated, the modern detergents greatly reduce this necessary work. However, he said, there is no such thing as a universal detergent because there is no universal contaminating substance, nor water, and

the detergent must be selected with the qualities of these two elements in mind. The real basis of all good sanitization, he said, is and always will be complete cleanliness which results in complete sterilization.

Candies and Nuts

The newer ideas developed on refrigerated storage of candies and nuts were presented and discussed by Dr. J. G. Woodroof of the Food Technology Department, University of Georgia. Dr. Woodroof pointed out that while the subject is relatively new a considerable amount of knowledge has been gained through experimental research as well as practical application of this knowledge. Peanuts and pecans, he said, particularly have gained much from refrigerated storage which makes possible the manufacture of nut candies the year around, instead of the former seasonal operation.

The subject of fruits and vegetables was reviewed by W. T. Pentzer of the Agricultural Marketing Division United States Dept. of Agriculture. Dr. Pentzer pointed out that the chief. problem in the fruit and vegetable storage is the prevention of spoilage and this can be accomplished through a selection of good commodities and holding them under proper temperature and relative humidity conditions, all of which are well known through experimental study and practical experience. Following his talk Dr. Pentzer showed a number of slides illustrating diseases and damage to fruits and vegetables.

Fisheries product are of growing importance to the refrigerated warehousing industry and the industry is consequently interested in research information on this subject. Highlights of fisheries products in refrigerated warehouses were presented by Dr. Charles Butler of the United States Fish and Wild Life Service, Interior Department. He emphasized that the first requisite for maintaining a good product is to have a good product to start with and then a conscientious use of known techniques. Applying standard procedure, he said, is very important.

Dairy products is another very important item of refrigerated storage and has been for many years, but considerable new information has been developed in recent years. The newer ideas on this subject were expressed by F. D. Newell, Jr., of the Minneapolis Cold Storage Company. He discussed specifically butter, cheese, frozen cream, frozen milk and canned condensed milk. Butter, he pointed out, is manufactured from cream and all cream is not the same and methods of manufacture are not the same. Therefore the warehousemen receive butter of varied quality. This presents a problem as to how best to handle this product so as to maintain it in the best possible condition.

Receiving Commodities

The subject of receiving and delivering commodities was covered by Frank Prusa, National Terminals Corporation, Cleveland. Mr. Prusa told about the procedure used by his company when receiving products for storage and processing. They are first inspected and a report made on their condition and whether the truck was properly insulated is checked. Warehouse receipts are mailed the same day and damaged or short packages are reported immediately.

Poultry products was discussed by Paul Vollmer, Produce Terminal Cold Storage, Chicago. These products, he said, are now coming in the year around instead of in peak loads as formerly and this makes possible a more standardized procedure. It is especially important that as nearly as possible constant temperatures be maintained, with a minimum of fluctuation, although moving a large consignment of dressed poultry into a room causes a rise in temperature and sweating, which is a problem in this connection.

New products for refrigerated storage, an important subject, was presented by James Kuehn, Wisconsin Cold Storage Company, Milwaukee. Mr. Kuehn said his company had been interested in this subject for many years and, through experiments and contacts with prospective customers, had developed a sizable volume of new storage products. Among those mentioned were rose bushes, cut flowers, processed cheese, motor testing under low temperature, candy and bakery products, cocoa powder, potted bulbs, penicillin, automobile batteries, coffee, and strawberry plants.

The subject of warehouse costs, with particular reference to handling was discussed in a very specific and able manner by Wm. Baker, Produce Terminal Cold Storage, Chicago. Mr. Baker has collected and compiled a vast amount of cost data for the National Association of Refrigerated Warehouses, and in recognition of this contribution, he was presented with a plaque by F. D. Newell, Jr. N. A. R. W. vice-president.

At the conclusion of the Thursday forenoon session, certificates of graduate training were presented to all those who attended the conference.

Research Advisory Council TRRF Meets

STARTING Thursday, January 13 a three-day meeting of the Refrigeration Research Foundation was held at the Edgewater Beach Hotel, Chicago. Purpose of the meeting was to review past work of the Foundation, particularly last year, and to make informal plans for the coming year's program. Informal reports were presented by H. C. Diehl, director, and leaders of the more important projects.

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SELF-TENDING!
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PREVENT CLOGGED NOZZLES!
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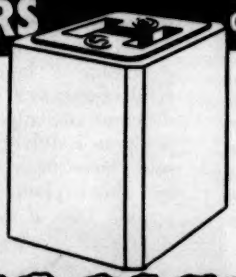

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Indiana and Ohio Joint Convention

THE OHIO and Indiana Associations of Ice Industries will hold a joint convention at the Biltmore Hotel, Dayton, Ohio, March 29 to 30. It was agreed by the directors of both associations that a combined meeting would attract a larger attendance, thereby making it possible to provide a more elaborate convention program and entertainment than could be carried out by one individual group. Also taken into consideration were the exhibitors who have developed many new machines and appliances to fit new needs of the industry.

Great Lakes Chapter Winter Meeting

THE Great Lakes Chapter of the National Association of Refrigerated Warehouses will hold its winter meeting at the Commodore Perry Hotel, Toledo, Ohio, February 9, it has been announced by Chairman David Stearns, president of the Milwaukee Cold Storage.

A featured speaker at the meeting will be Dr. H. C. Diehl, director, The Refrigeration Research Foundation.

Boom in Ice

(continued from page 28)

at the rear and a canvas shower curtain at the front door, so that very little hot air gets into the box on opening and servicings.

OVERALL COST AT VENDING STATIONS COST PER 100 POUNDS PARTY ICE AT TIME OF VENDING

Cost of ice,	.178
Labor of bagging and sealing,	.248
Cost of bags and locker tape,	.221
Service of venders, including hauling and loading,	.098
Repairs and supplies,	.058
Rent or commission,	.331
Power,	.005
Supervision,	.006
Depreciation—12½ years life,	.163
Insurance and incidentals,	.011
	1.319
100 lbs. party ice yields,	$ 3.125
Net profit per ton—party ice.	36.17
Net profit per ton—solid ice	4.20

SALES AT VENDING STATIONS TEN-MONTHS COMPARISON

1952,	862,732
1953,	1,244,780
1954,	1,790,525

As our vending sales started out about 60 percent solid and 40 percent party ice, the total sales continued upward sharply, but the solid ice sales are on a constantly downward curve. We can visualize in the near future almost all sales being party ice and, at the present rate of increase, it should not be too long before the annual sales approach 2,000 or 2,500 tons and, at the indicated profit, it will surely be a great boom to our retail business.

Refrigerated Warehouse Center Calumet District

(continued from page 24)

completion about June, 1955. It will have a large amount of freezer space as well as freezing facilities.

A large part of the 174,000 square feet of space vailable during 1954 has already been assigned and will house the inventories of many of the leading manufacturing sources of the Independent Grocers' Alliance, IGA, will use the Calumet Industrial District super warehouse as a major source for its wholesale distributors, who supply approximately 10,000 retail stores.

Don Grimes, President of IGA, says the new facilities will help them to increase their dollar sales.

Polar
PROCESSED ICE VENDOR
The year 'round demand for processed ice is increasing! You can make cubed and crushed ice available in all convenient locations in your city with POLAR Processed Ice Vendors. The investment is surprisingly low!
ICE
24 HOUR SELF SERVICE

MERCHANDISE PROCESSED ICE

24 Hours a Day

Available in two models: Model C-1 (single) Belt capacity 40 — 10 lb. bags. Storage 200 — 10 lb. bags. Model C-2 (double) Belt capacity 40 — 10 lb. bags on each belt. Storage 350 — 10 lb. bags.

Write or Wire Today for descriptive literature and prices. Dept. I-2.

REFRIGERATION ENGINEERING COMPANY

MONTGOMERY • MINNESOTA

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EXTRA LARGE

Capacity...

THERMOBANK

for Freon and Ammonia

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The only completely automatic system for freezing temperatures offering these extra large capacities. THERMOBANK requires no manual attention whatsoever.

Ceiling mounted, THERMOBANK takes no precious floor space. You can store products directly under the unit.

Can be used as an independent system or with an existing large system without affecting the operation of other evaporators.

WRITE FOR BULLETIN TA249-F

KRAMER TRENTON CO.
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Materials Handling Exposition

THE 1955 National Materials Handling Exposition will be the most comprehensive in the eight-year history of the show, according to Clapp & Poliak, Inc., New York, founders and producers of the event. The show will be held during the week of May 16 to 20 in the new exposition hall recently completed as an addition to the International Amphitheatre, Chicago, Ill.

More than 200 companies will participate and their displays will cover an area of 115,000 square feet of booth space. This will represent a 15 per cent increase over the indoor exhibit space used in 1951 when the industry last held its exposition in Chicago.

In addition to the show, a Materials Handling Conference will be held concurrently with the exposition to permit visitors to supplement their inspection of machinery with discussions of case histories of materials handling installations in the nation's leading factories and warehouses.

The theme for the show and conference is "The Concept of Obsolescence," selected because it emphasizes the rapid out-moding of handling equipment. Most of the handling devices introduced during the exposition's first year in 1947 are already out-moded because of rapid advances in this new industrial science.

Super Refrigerator Cars For Low Temperatures

FIFTY compact low-temperature systems specially designed for a Pacific Fruit Express Company fleet of "super" refrigerated freight cars were ordered in mid-November, it was announced by Charles V. Fenn, vice president, Machinery & Systems Division, Carrier Corporation. The systems automatically provide temperatures down to minus 10 F regardless of outside conditions, Mr. Fenn stated. Governed by sensitive thermostatic controls, they will permit these Pacific Fruit Express Company freight cars to carry frozen commodities from Canada to the blistering climate of Mexico without temperature change inside the cars.

The new Pacific Fruit Express cars are an outstanding example of the current trend toward construction of cars with mechanical low-temperature equipment for handling frosted foods. The super reefers will carry a maximum of 70 tons of perishable goods. The Carrier executive noted that the trend toward mechanically refrigerated all-purpose cars may also lead to a substantial number of installations in existing reefers.

Cooling is achieved by circulating air through a channel containing light weight aluminum finned cooling coils. The central source of power for the system, a diesel-driven electric generator, supplies current for refrigerating compressor motors. One feature of the new Carrier system is a sensitive defrost control which stops the compressors and turns on quick-action heating coils as frost builds up. When the frost has been melted, the refrigeration system is again turned on, prohibiting any chance of spoilage.

Fairmont Foods Plant Sold

SALE of the Fairmont Foods Company processing plant and cold storage warehouse in Webster City, Ia., to Morton Packing Company, Louisville, Ky., was announced jointly by the two firms. Morton will continue operation of the poultry and cold storage business and also will manufacture frozen meat and fruit pies.

Florida Ice Safety Shows Improvement

REPORTS received by the Florida Department of Industrial Safety show that September and October were exceptionally safe months for ice makers in Florida. July and August, on the other hand, were pretty bad. The 1953 frequency rate was 51.2 disabling injuries per million man-hours while, the 1954 rates are less than half this high. The July frequency rate was 33.7, August was 38.1, in September it went way down to a low 14.7 and in October the rate was 18.9.

In order of size group, the next to the largest group was by far the worst. The two groups of smaller plants and the group of the largest plants were much safer and had entirely satisfactory injury frequency rates of less than 12 injuries per million man-hours. Twelve plants in group 3 reported disabling injuries, more than twice as many plants with injuries as in any other size group.

COMING CONVENTIONS

OKLAHOMA ASSOCIATION OF ICE INDUSTRIES
February 6-8, 1955
Broadview Hotel, Wichita, Kans.
HARRY T. HUDSON, Secretary

KANSAS ASSOCIATION OF ICE INDUSTRIES
February 6-8, 1955
Broadview Hotel, Wichita, Kans.
THOMAS CARROLL, President

GREAT LAKES CHAPTER N.A.R.W.
February 9, 1955
Commodore Perry Hotel, Toledo, Ohio
DAVID SEARNS, President

SOUTHWESTERN ICE MANUFACTURERS ASSOCIATION
February 16-18, 1955
Robert Driscoll Hotel, Corpus Christi, Texas
P. A. WEATHERRED, Secretary-Counsel

SOUTHERN ICE EXCHANGE
February 22-23, 1955
Dinkler Plaza Hotel, Atlanta, Ga.
MILDRED NICHOLS, Secretary

GEORGIA ASSOCIATION OF ICE INDUSTRIES
February 22-23, 1955
Dinkler Plaza Hotel, Atlanta, Ga.
MILDRED NICHOLS, Secretary

NORTH CAROLINA ICE ASSOCIATION
March 7-8, 1955
Washington Duke Hotel, Durham, N.C.
LEWIS H. POWELL, Secretary

OHIO ASSOCIATIONS OF ICE INDUSTRIES
March 28-30, 1955
Biltmore Hotel, Dayton, Ohio
ELIZABETH SHANNON, Secretary

INDIANA ASSOCIATION OF ICE INDUSTRIES
March 28-30, 1955
Biltmore Hotel, Dayton, Ohio
ROBT. WALTON, Secretary

AMERICAN WAREHOUSEMEN'S ASSOCIATION
April 12-16, 1955
Edgewater Beach Hotel, Chicago, Ill.
WM. K. DALTON, General Secretary

NAPRE MIDWEST REGION ENGINEERS CONFERENCE
April 30 — May 1, 1955
Congress Hotel, Chicago, Ill.
BERT C. MCKENNA, Chairman
WM. L. TIFFIN, Sec., 37 W. Van Buren St., Chicago

YORK REFRIGERATION VALVES AND FITTINGS

posi-tive seal

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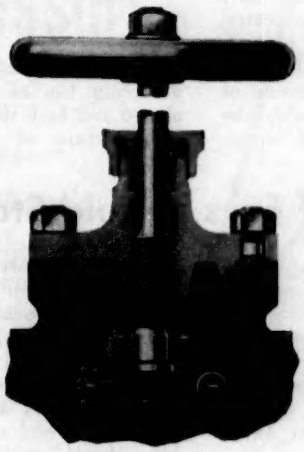

FACT: Of course York Valves have *positive seal* because York Valves have...

• Soft metal seating surfaces for main and back seat. • Pressure seal between disc and lock nut. • Seating surface bonded metallically to valve disc. No leaks—no loosening. • Seating metal specially refined. Uniform and close grained. • Seats match. Formed at factory with over a ton of pressure per square inch.

FACT: York offers the industry's most complete line—with pipe sizes from ¼ in. to 14 in.

CONCLUSION: These two facts help account for a third—more York Valves and Fittings are in use than any other make. If you're planning a new plant or an addition to your present plant—regardless of what make refrigeration equipment you use—call York. **(York "FREON" and AMMONIA Valves and Fittings are handled by York District Offices and Authorized Jobbers.)**

IT ALWAYS PAYS TO USE YORK ACCESSORIES AND SUPPLIES
Air Filters • Air Fittings • Automatic Controls • Brine Testing Sets • Can Covers • Can Dumps • Can Fillers • Charging Connections • Coils and Piping • Cold Storage Doors • Freon Refrigerants • Gas Masks • Ice Cans • Meters • Pumps • Oil • Oil Traps • Purge Devices • Receivers • Suction Traps • Valves and Fittings.

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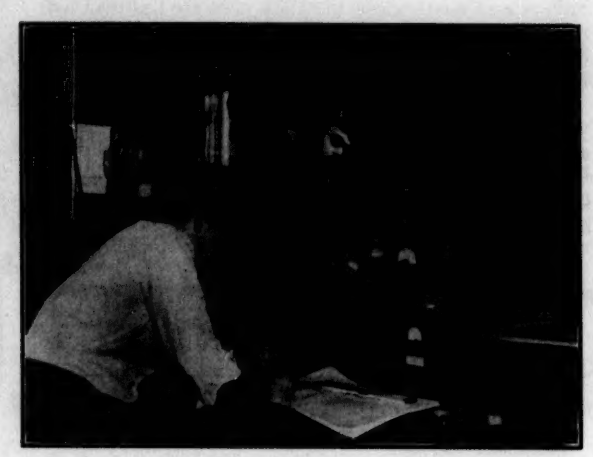
HEADQUARTERS FOR MECHANICAL COOLING SINCE 1885

Environmental Test Chambers Subject Electronic Equipment To Varying Temperatures, Humidities and Corrosion

A NEW Environmental Test Laboratory has been constructed by The Sperry Gyroscope Company, consisting of a dozen chambers equipped with modern devices for subjecting electronic equipment to varying conditions of atmospheric pressure, temperature, humidity, shock, vibration, and corrosion or contamination from sand, dust, and salt.

The temperature range simulated in these test chambers extends from minus 100 to plus 200 F while relative humidities from 20 to 95 percent are available. Refrigeration for cooling is supplied by 14 "Eclipse" compressors of various sizes, using Freon-22, and arranged for multistage compression under automatic control. Electrical resistance elements are placed in the air stream to provide the upper ranges of the temperature scale.

Humidity conditions in the chambers are varied by a wet-bulb control regulating the amount of water available to the air stream. Thermocouple-type instruments keep an accurate check on ambient conditions. Once the desired atmospheric characteristics are set-up on the central control panel, automatic controls maintain them to a negligible variation, depending upon the amount of heating which might possibly be generated by the piece of equipment being treated. The Tenney Engineering Co. of Union, N.J., designed and built these test chambers.



Operator is transcribing readings from chamber in Test Laboratory of Sperry Gyroscope Company.

A picture of the refrigerating equipment is shown in the cover picture of this issue, showing four of the fourteen condensing units, all automatically controlled.

Upgrading of Eggs in Cold Storage Charged in News Story

A NEWS story, in the Chicago Daily News December 16, charged carelessness is sampling cold storage holdings of eggs, resulting in up-grading of eggs received by commercial warehouses for storage. According to the Daily News, egg inspection reports for the year 1949-1952 at Chicago revealed:

That hundreds of carloads of cold storage eggs received higher grades after an average of six to seven months in the warehouse than when they went in.

Of 717 carloads graded in the year 1952, 457 cars of 63.7 percent got higher ratings in the fall out of storage than in the spring when they went in.

The windfall profit to receivers figured at the estimated average price of 48 cents a dozen was $119,240.

Of 974 carloads graded into storage in the spring of 1950 and out in the fall, approximately half were upgraded to give the owners a windfall profit estimated at $100,520.

In 1949 and 1951, years of small storage supplies, upgrading on 96 carloads brought unearned profits of approximately $40,000.

Everette B. Harris, president of the Chicago Mercantile Exchange, said he doubts there is any collusion or bribery in the produce markets here; as was discovered last year at New York. "It's just sloppy work," he said. "Workmen aren't as conscientious and careful as they used to be. There has been a general letdown."

After an FBI investigation of the New York produce market, officials of 19 firms and two federal graders were indicted on May 4, 1953, by a federal grand jury. (The grand jury charged that inspectors accepted bribes to approve and grade inferior eggs without examination. One former federal inspector pleaded guilty and was sentenced. The case against others is still pending.)

A Chicago operator of a refrigerator warehouse which stores shell eggs for the public stated that in his opinion the inspectors employed by the government were of fine caliber and free from any suspicion of bribery. He also was certain that warehouses and their employees could not be accused of dishonesty or collusion in improper inspections. He said that samples for inspections were ordinarily withdrawn and taken to inspection rooms by warehouse employees, but that the inspectors themselves had the right to select samples. Their privilege of selection of samples was not usually excercised. It was this warehouseman's opinion that differences in grading eggs in warehouses was largely due to a lack of standardization of the rules of inspection and human differences in determining the quality by the inspectors.

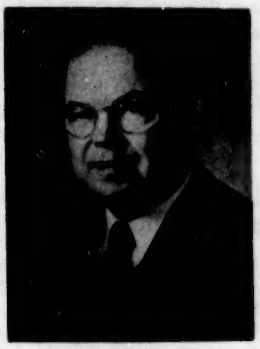
The government depends upon the warehouse to select 14 cases from a carload (480 cases of 30-dozen each) as a sample. The only requirement is that a different 14-case sample be taken on inspections than was taken when the eggs went into storage.

Lawrence J. Dolson, who supervises several hundred federal egg inspectors in 12 Midwest states, when asked about the analysis revealing up-grading, explained that egg samples vary widely and a different sample is pulled each time there's an inspection. He added: "The human element enters, too. All men don't grade alike. We're constantly checking our men to see if there's improper grading."

News of People

Brandt Opens Office As Consulting Engineer

FOLLOWING his retirement as president of Westerlin & Campbell Company last September 30, Fred T. Brandt has opened an office to engage in consulting work in connection with industrial refrigeration at 1005 West Belmont Avenue, Chicago, Ill.



Fred T. Brandt

Mr. Brandt had been with Westerlin & Campbell Company for over 30 years, covering the seven midwestern states for York Corporation. Throughout the years he kept in close touch with the midwestern refrigeration industry through talks to many national and local groups. His many associates will be interested in learning of his new business activity.

Carlson New Vice-President City Products

ANNOUNCEMENT has been made by William J. Sinek, President of City Products Corporation, Chicago that A. R. Carlson has been elected a member of the board of directors of the Corporation. Mr. Carlson, a vice-president of the corporation, will assume direction of all City Products Corporation activities in the ice, fuel and cold storage fields, with the exception of those in the greater St. Louis area. H. S. Humason, a vice-president of the Corporation, will act as manager and A. R. Current will act as assistant manager of the Cold Storage Division under the guidance of Mr. Carlson. Messrs. Carlson, Humason and Current will make their offices in the headquarters of the Corporation in Chicago.

Richard C. Muckerman, vice-president, has been assigned to direct the corporation's extensive activities in the railroad car icing, commercial ice, cold storage and fuel fields in the greater St. Louis area. City Products Corporation is currently expanding its nationwide activities which include railroad car icing, breweries, cold storage warehouses, commercial ice, dairies, precooling plants, and gas and oil production.

Smith Heads Car Icing For City Products

ANNOUNCEMENT has been made by William J. Sinek, president of City Products Corporation that Robert L. Smith has been appointed general superintendent of the nationwide railroad car icing activities of the Corporation with the exception of those in the greater St. Louis area. Mr. Smith will operate under the guidance of A. R. Carlson who is a vice-president and director of the Corporation.

Mr. Smith, formerly with Railways Ice Company for over twenty years, has had broad experience in the railroad car icing field and other allied activities. He will maintain his offices in the headquarters of City Products Corporation in Chicago.

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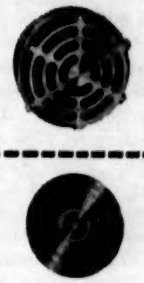
peak performance
INTO YOUR
compressors
(AIR • GAS • AMMONIA)



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Check THESE VOSS VALVE ADVANTAGES:

- Quiet, vibration-free operation
- 20 to 60% more valve area
- less power consumption
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Our detailed proposal for increasing the efficiency of your compressor will be sent you without obligation. Send us the name, bore, stroke, and speed of your machine.

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DONALD K. TRESSLER, President, announced recently that GERALD A. FITZGERALD, prominent food technologist, recently Food Industry Advisor to Government of Iran, has joined the firm of Donald K. Tressler and Associates, Westport, Connecticut, as vice-president and general manager. The firm will expand its research, consultation and management engineering services to the food manufacturers to include: product and process development, production enginering; and quality control, pest control and sanitation systems. Complete technical services to the frozen food industry, including materials handling methods, equipment in transportation, certain merchandising services, and warehousing have also been added.

HARRY F. GRIESE has been appointed to the Refrigeration Sales Department in La Crosse, Wisconsin, according to a recent announcement by The Trane Company, manufacturing engineers of heating, air conditioning, ventilating and heat transfer equipment. Mr. Griese came to The Trane Company after acquiring experience as an application, development and sales engineer in air conditioning and refrigeration.

DEATHS

Fred F. Rhode

THE death of Fred F. Rhode, senior vice-president of City Products Company, Chicago, occurred unexpectedly Friday, December 17. Mr. Rhode had been with City Products for many years, extending back during the time the company was known as the City Ice & Fuel Company. He was widely known among middle west ice men and respected for his knowledge of the ice business and his sound judgment. His passing will be felt by all who knew him.

Fred F. Rhode

WILLIAM H. TUMBRINK, assistant vice-president and secretary of the Federal Cold Storage Company, Jersey City, N. J. before retiring three years ago, died unexpectedly January 7 at his home, University City. He was 72.

GUNNAR BERG, specialty products manager of the Westinghouse Electric International Company, Teaneck, N. J., died of a heart attack January 7. He was 55. Mr. Berg was a specialist in air conditioning and commercial refrigeration equipment.

DEE WILSON TACKETT, formerly manager of The Merchants Cold Storage Company, Dallas, Texas, until he retired in 1946, died December 9 at his home in Arlington, Texas, after a short illness. He was 62.

Liquid, Frozen and Dried Egg Production

LIQUID egg production during November totaled 8,608,000 lbs. compared with 8,428,000 lbs. in November last year and the 1948-52 average of 5,636,000 lbs. The quantities used for immediate consumption and drying were less than a year ago. The quantity frozen was larger.

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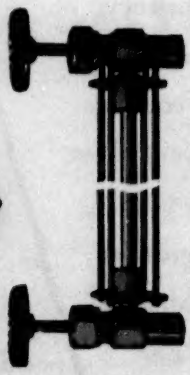
AMMONIA
VALVES
Well Engineered
Precision Built



ALL-STEEL GAUGE SETS with automatic shut-off of liquid in case of glass breakage.

RELIEF VALVES for Ammonia and Freon. Positive relief action. Pressures from 75 to 300 lbs.

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END BOTHERSOME Hand Purging

SAVE Time, Trouble, Money with an ARMSTRONG FOUR GAS PURGER

NOBODY likes hand purging. It is a messy, smelly, time-consuming job.

But purging doesn't have to be a disagreeable task—not when an Armstrong purger does it for you:

SAVES MANUAL PURGING TIME: Time otherwise wasted on hand purging is saved for other duties.

SAVES PUMPING DOWN TIME: No need to pump down the system after opening it for repairs.

ELIMINATES EXCUSES FOR NOT PURGING: Purging is so easy with an Armstrong purger that there is no reason for postponing the job.

For full details on Armstrong Purging, ask for FREE BULLETIN No. 221.

ARMSTRONG MACHINE WORKS
860 Maple Street, Three Rivers, Michigan

MANUFACTURERS' NEWS

Byers Markets New Wrought Iron Tubing

CORROSION-Resistant cold drawn wrought iron tubing manufactured to precise tolerances for installation in heat transfer apparatus and air conditioning systems is being actively marketed for the first time by A. M. Byers Company. The company announced that orders for the new tubing are being handled by field engineers through division offices in New York, Chicago, Boston, Washington (D.C.), Philadelphia, Pittsburgh, Atlanta, Houston, St. Louis and San Francisco.

Specific services in which the tubing's resistance to corrosion and fatigue failure help reduce the frequency of repair or replacement include: Ammonia condensers, heat exchangers, pre-heaters, gas cooling apparatus, gasoline condensers, evaporators, vaporizers producing Butane and Propane gas, cooling pipe and steam condensers. According to records maintained by the Byers' Engineering Service Department, the new cold drawn tubing is especially suitable for handling salt and brine solutions in air conditioning systems.

Wrought iron tubing is manufactured to closer dimensional tolerances than wrought iron pipe. In actual physical characteristics, however, wrought iron tubing and pipe are similar, each providing identical protection against corrosion and fatigue failure. Like wrought iron pipe, the cold drawn tubing is comprised of high purity iron and iron silicate in physical rather than chemical association. The iron silicate, a type of glass-like slag, occurs in thread-like form throughout the high purity iron. This combination gives the metal a strong, hickory-like structure and the slag fibres, numbering some 250,000 per square cross-sectional inch, disperse the attack of corrosive forces and prolong the life of the tubing.

Carrier Centrifugals to Puerto Rican Refinery

REFRIGERATION and wet gas feed compressers for a new oil refinery under construction in Puerto Rico, for the Commonwealth Oil Refining Company, will be supplied by Carrier Corporation, Syracuse, N. Y. One hydrocarbon compressor, drive by a 1,250 hp motor, will supply refrigeration for the refinery's Alkylation process. The other two compressors, one 2,500 and another 3,000 hp, will operate in series as wet gas feed compressors for the Houdry catalytic process.

The refinery, at Guayanilla Bay, 15 mines west of Ponce, will be the largest in Puerto Rico. When completed in late 1955, it will process about 25,000 barrels daily of Venezuelan crude oil into aviation and automotive gasolines, bottled gas, kerosene, and diesel and fuel oils. The Lummus Company, New York, are the engineers.

Hawco Joins Sporlan

FRANK C. HAWCO has joined Sporlan Valve Company's field sales organization, it was announced by that company. Mr. Hawco holds a B.S. degree from

Frank C. Hawco

Northwestern University and has extensive experience in the field of air conditioning and refrigeration. For the present he will work out of Sporlan's Mt. Vernon, New York office providing additional sales coverage for its greater New York City, and northern New Jersey territory.

DuPont Ends Drop Shipments of Freon

DROP shipments of "Freon" fluorinated hydrocarbon refrigerants in any quantity for use in replacement or service work will be discontinued February 1, 1955, the du Pont Company's "Kinetic" Chemicals Division has announced.

The change means that stocks of Du Pont refrigerants will be maintained by recognized wholesalers, with no direct shipments from Du Pont warehouses to purchasers for service work or replacement in existing equipment. Elimination of drop shipments, the company said, should lead to more rapid handling by wholesalers of both regular and emergency requirements of servicemen, contractors, dealers and ultimate users.

Shipments to wholesalers will be made only to their regular places of business. Under a plan in effect since February 1, 1954 drop shipments had been permitted on orders in excess of 600 pounds net.

Ton Tanks of F-22

TON TANKS of "Freon-22", are now available at East Chicago, Ind, and at the DuPont Company's Los Angeles warehouse, the "Kinetic" Chemicals Division of the DuPont Company announces. Because this material formerly was available in ton containers only from the company's manufacturing plant at Carney's Point, N.J., the change means a saving in freight for large quantity users in the Middle West and the Los Angeles section.

Thermotank Builds New Plant in Detroit

CONSTRUCTION has begun on a $100,000 sheet metal-producing plant for Thermotank, Inc., Hugh P. Walker, executive vice president of the Detroit air conditioning company announced. The new plant, to be located at 11191 Lappin Avenue, Detroit, will measure 16,800 sq. ft. and occupy a two-acre site when completed. It will replace the company's temporary Huston and E. Warren Street plants, now producing under the name of Dogendorf Sheet Metal, Inc.

Thermotank, Inc., which became a Michigan corporation in 1951, selected Detroit as its American location with the help of the Michigan Economic Development Department. The search for a plant or site started in November, 1950. Since its founding in 1898 in Glasgow, Scotland, the company has located subsidiary plants throughout Great Britain and its Dominions. It was responsible for the first air-conditioning units ever to be installed in ships, and today most of the large European liners are equipped with Thermotank systems.

The new plant, it was expected, would be completed by the end of December, Mr. Walker said. Current employment at Thermotank is 170, with further increases expected as expansion is continued. At present, Thermotank's two biggest customers in the United States are General Motors and the Ford Motor Company. The company's offices are located at 1509 Broadway, Detroit.

Niedermeier to Sporlan's Kansas City Office

THE appointment of R. E. Niedermeier to take over the new Kansas City office is announced by the Sporlan Valve Company. This office serves Montana, Wyoming, Colorado, New Mexico, Kansas, Nebraska, and parts of Missouri and Iowa. Mr. Niedermeier, who holds a B.S. degree from Evansville College, has an extensive background in refrigeration and air conditioning. He was formerly service manager of one of the major manufacturing companies in the industry. Sporlan's Kansas City Office is located at 7110 Virginia Street.

R. E. Niedermeier

Shute Joins Fire-Ban

FIRE-BAN sales have been placed in charge of John T. Shute, it was announced by Elmer H. O'Neill, president of the E. H. O'Neill Floors Co., Chicago. Mr. Shute, an insulation engineer, will be responsible for sales of the Fire Ban development, a permanent fire retardant surface coating developed by O'Neill. Shute joined the O'Neill organization on November 15, 1954. Prior to that he had been sales engineer for the Sherman Putnam Sales organization of Chicago.

John T. Shute

Born in Milwaukee, Wisconsin, Jack Shute received his education at Virginia Polytechnic Institute, University of Illinois and Northwestern University. He is a member of Chicago Chapter NAPRE.

Dowling New Assistant Vice-President of York

THE appointment of Roger H. Dowling as assistant vice-president Product Quality of York Corporation, has been announced by Stewart E. Lauer, president of the York, Pa., air conditioning and refrigeration firm. Formerly general service manager at York, Mr. Dowling will now have overall responsibility for the quality and serviceability of all products marketed by the Corporation. Serving under the vice-president-engineering & research, Mr. Dowling will work with all divisions and departments on matters relating to product quality.

Carrier — Affiliated Gas Merger Approved

THE program for merging Carrier Corporation and Affiliated Gas Equipment, Inc., has been approved by the Boards of Directors of the two companies, subject to legal requirements including ratification by stockholders. This was announced by Cloud Wampler, president and chairman of Carrier, and Lyle C. Harvey, president and general manager of Affiliated, who point out: "The merger will bring together the pioneer of the air conditioning industry and one of the most important companies in the residential heating business and related lines."

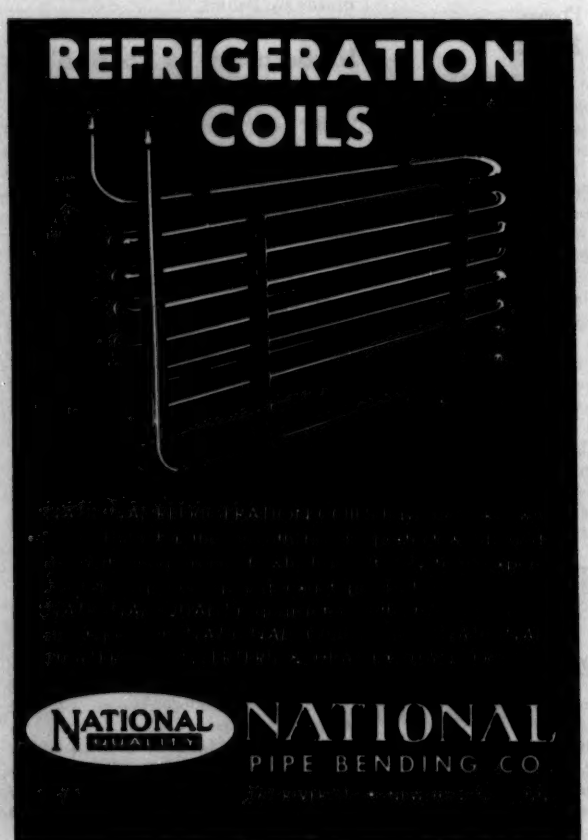
Mr. Wampler said present plans are that the two major operating divisions of Affiliated Gas Equipment, known as Bryant and West Coast, will become operating divisions of Carrier Corporation.

Beyster Detroit Architects Open New Offices

NEW OFFICES at 700 Griswold Building, Detroit 26, Michigan, were opened by H. E. Beyster & Associates, Inc. in November 1954, architects and engineers in the Detroit area for two generations. The firm has changed office locations principally to afford more space to the expanding engineering organization. H. E. Beyster & Associates, Inc., are the engineering firm for the Northland Center which 7200 ton refrigeration application was described in the January issue of INDUSTRIAL REFRIGERATION.

Oberlin Associates with Plonsker Engineering Co.

PLONSKER Engineering Company, engineers and contractors of heating, air conditioning, refrigeration and industrial piping, announced in December the association of James Oberlin. Mr. Oberlin, formerly with National Korect-aire, Chicago, brings 15 years of refrigeration experience with him to the Plonsker firm. His previous refrigeration experience was with Kelvinator. Prior to that time he had been employed in district heating at Lansing, Michigan. He is a member of Chicago Section, ASRE, and currently acting as membership chairman for that group.



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All classified advertisements are payable in advance. Except for Positions and Help Wanted classifications, this section is reserved exclusively for USED equipment.

RATES: 20c per word; minimum 25 words. $2.00 per line for bold face headings: $15.00 per inch for line listings.

ICE PLANTS—for sale

WANTED—Good used Ice Plant to be moved. 30 to 50 ton capacity. State age, condition, number of can lift, location and price. Write Box FB-6, c/o Industrial Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

FOR SALE—15 ton York ice plant. 3x3, 5x5, 8x8, 9x9 Yorks, 10 and 15 ton shell & tube condensers, 10" x 7" Worthington booster compressor. Write E. Niebling, 1546 St. Clair Ave., Mt. Healthy, Cincinnati 31, Ohio.

FOR SALE OR RENT—Florida Gold Coast. Approximately ½ block from Court House. Poured concrete building, 100,000 cubic ft., 250 ft. R.R. siding; 30 ton ice and storage plant; many opportunities. Equity $31,500; easy terms; consider out of state property part payment. Brokers co-operate. A. Lester, 5100 Maggiore St., Coral Gables, Fla. Phone MO6-2306.

FOR SALE—USED ICE PLANTS & REFRIGERATING EQUIPMENT
Complete Ice Plants 20 to 100 Tons
Ammonia Compressors, 3" x 3" to 12½" x 14½"
Condensers, Cranes, Blowers, Scoring Machines, Ice Canes—Various sizes, 100# — 300# Ice Cubers. Write or wire us on any equipment you may need.
ENTERPRISE EQUIPMENT CORPORATION
77-79 Alexander Street, Yonkers, New York
Cable Add.: ENEQCO Ph.: Yonkers 8-8118-9

FOR SALE—Sprinkman refrigerator door, for a 3'0 x 6'4" opening; very good condition. Level Valley Dairy Co., Route 1, West Bend, Wis.

USED EQUIPMENT—wanted & for sale

FOR SALE — 8x8 Frick ammonia compressor with 50 h.p. motor, 3/60/220-440; new 1953. V-belt, high speed. Write your needs. Born Company, 80 E. Jackson Blvd., Chicago 4, Ill. WAbash 2-3299.

FOR SALE
12½ x 14½ York — 10x10 York 125 h.p.
9x9 York 75 h.p. —
10x10 York with Unaflow steam engine.
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FOR SALE—Two type G Bruce MacBeth gas engines, hundred h.p. exciters, generators and complete control switchboard at salvage price. Diamond Ice Co., Purcell, Okla.

FOR SALE — Vilter ammonia compressor, motor, a complete 400 ton refrigeration high side. Reliable owner assures excellent condition. Write your needs. Born Company, 80 E. Jackson Blvd., Chicago 4, Ill. WAbash 2-3299.

FOR SALE—2 Allis Chalmers 40 h.p., 3 ph. motors, 865 r.p.m., 2200 volt, guaranteed. 255 ice cans, 300 lb. 44" deep, 11½ x 22½ top, 10¼ x 21 bottom. Stanley J. Asrael, P. O. Box 902, Alexandria, Va.

FOR SALE — Small ammonia compressors, York, Frick and Vilter 6x6, 7½x7½, 8x8, 9x9, 10x10. Ice plants, cans, cranes, agitators, blowers, Diesels. Parke Pettegrew, 370 W. Broad St., Columbus 8, Ohio.

FOR SALE — York 10x10 twin cylinder single acting ammonia compressor Model D-8 with electric machine 150 h.p. V-belt drive, price $1,500, "as is". Address Box FB-12, c/o Industrial Refrigeration.

FOR SALE — Vilter duplex compressors, 10½-x10½, Serial No. 269501-2 with "Burke" 250 h.p. synchronous 60/220/3/300 r.p.m. motors, controls, condensers, etc.; still erected in small brewery in Eastern Penna.; absolutely first class condition. Write Box FB-10, c/o Industrial Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

FOR SALE — COMPRESSORS
1 — York 8x3 ammonia compressor complete with direct connected synchronous motor, switch board and M.G. set. 172 r.p.m., 2200 volts, 3 phase, 60 cycle. Price $500.00.
1 — York 10x10 ammonia compressor, force feed lubrication, complete with direct connected synchronous motor, switch board and M.G. set. 172 r.p.m., 2200 volts, 3 phase, 60 cycle. Price $800.00.
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Salisbury, Maryland

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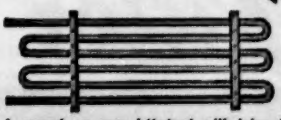
Coils and Bends of any metal or design engineered to your requirements. Send us your problems for engineering assistance.



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in carbonated drink bottling plants

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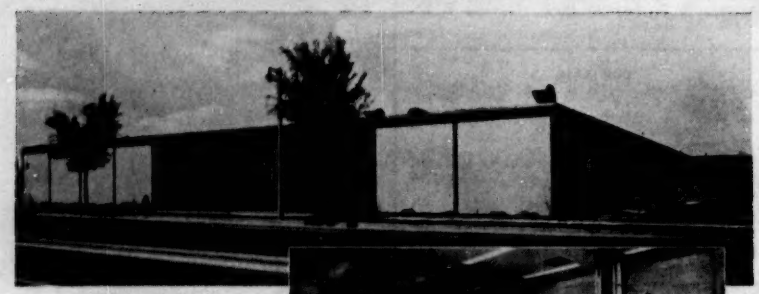
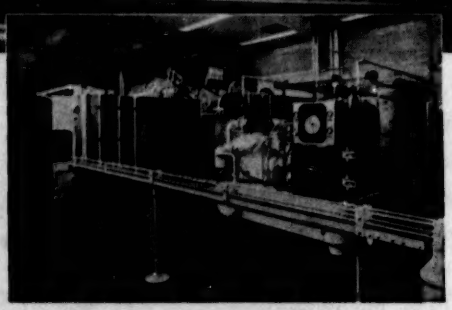


PEPSI-COLA'S NEW MILWAUKEE HOME



DRINK PEPSI-COLA

● Producing quality, highly carbonated drinks efficiently in today's bottling plants requires well-engineered cooling equipment to guarantee uniform carbonation. In the new Pepsi-Cola home in Milwaukee—the most modern plant of its kind in the world—Vilter equipment was selected to provide the refrigeration.

Two Vilter four-cylinder VMC ammonia type compressors, each driven by a 75 h.p. motor, are used in the Mojonnier Carbo-Cooler installation at this Pepsi-Cola plant. Syrup and water are cooled and carbonated simultaneously. The mix enters the Carbo-Cooler at 75° F. and leaves at 33° F. The Carbo-Cooler has a capacity of 260 bottles per minute!

The Pepsi-Cola plant maintenance engineer is pleased with the performance of the Carbo-Cooler which depends upon Vilter compressors for refrigeration. He states that he has never had trouble since the equipment was installed, and that it is one of the smoothest jobs he has ever handled.

Call upon Vilter to provide you with reliable and efficient refrigeration specifically suited to your application . . . to save you money . . . to speed-up your refrigeration processes.

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Your nearby VILTER Representative or Distributor will be glad to tell you more about VILTER's experience in a bottling industry.

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THE VILTER MANUFACTURING COMPANY, MILWAUKEE 7, WIS.

Air Units • Ammonia & Freon Compressors • Booster Compressors • Baudelot Coolers • Water and Brine Coolers • Blast Freezers • Evaporative & Shell & Tube Condensers • Pipe Coils • Valves & Fittings • Pakice and Polarflake Ice Machines

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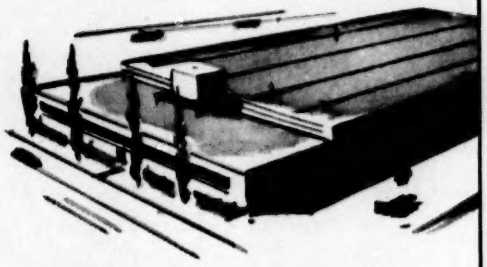

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One of the largest cold storage warehouses in the country! Capacity: 20,000,000 lbs. Operated at minus 10° F.—minus 20° F. for quick freezing.

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MEMPHIS 14, TENNESSEE

December 29, 1954

Mr. Allen W. Cox, Manager
Low Temperature Insulation Sales
Owens-Corning Fiberglas Corporation
Toledo 1, Ohio

Dear Mr. Cox:

It has now been almost two years since the completion of the installation of your Fiberglas Cold Storage insulation materials in our new $2,000,000, minus 10° F. freezer plant in Memphis, Tennessee. As you know, over 60 carloads of Fiberglas were used in this building.

You will recall that this cold storage plant contains over 1,000,000 cubic feet of sub-zero refrigerated space, that we normally run at about minus 10° F., and that can be brought down to below minus 20° F., for quick freezing, when needed. We have a capacity of about 20,000,000 pounds of frozen food, with in and out handling facilities to move around 100 tons through the warehouse each day.

Through our associated Memphis Cold Storage Warehouse Company, we have been in the cold storage business in Memphis for about 50 years and have never previously used Fiberglas insulation. In fact, Charles Conley, our Chief Engineer, who had been with us for 46 years, since 1908, was most skeptical of Fiberglas and talked about leaving our employ, if we insisted on using Fiberglas insulations for our new warehouse.

In spite of this background, we decided to and did install Fiberglas for all of the insulation requirements of this new Mid-South warehouse, specifying the installation on the basis of the rated insulation values claimed by your company, the manufacturers. Our York Corp. refrigeration equipment capacity was likewise installed on the basis of your company's computed efficiency of the Fiberglas insulations.

We have been operating the Mid-South warehouse on an occupancy basis substantially in excess of the national average for refrigerated warehouses and have had what we consider fair tests for a fair period of time.

I am delighted to report that we, the owners, and Charles Conley and Alvie Clay, our company engineers, have been completely satisfied with the performance of this Fiberglas installation, and consider our new freezer facilities as the last word in insulation efficiency. In fact, Fiberglas has done a so much better job than you claimed it would do, that we find that we have excess refrigeration machinery and equipment, even after full allowance for a fair emergency load factor.

Our main purpose for writing you about this situation is our appreciation of your company's cooperation and help in constructing this facility.

Very truly yours,
MID-SOUTH REFRIGERATED WAREHOUSE COMPANY
By William W. Goodman
William W. Goodman, President

WWG:lj

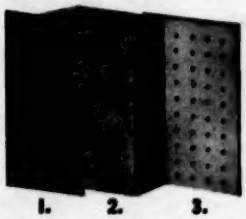
"Last word in efficiency!"

reports big Memphis cold storage plant on Fiberglas PF Dry Wall Construction

Proof that Fiberglas* PF Dry Wall Construction gives trouble-free service is found in the above letter from William W. Goodman, president of Mid-South Refrigerated Warehouse Company, Memphis, Tenn. Most significant of all is this statement—"Fiberglas has done a so much better job than you claimed it would do, that we find we have excess refrigeration machinery and equipment, even after full allowance for a fair emergency load factor."

Before you spend money for costly multiple-barrier insulations, get all the facts about Fiberglas PF for Dry Wall installation—the insulation that *stays dry . . . stays efficient.*

Mail the coupon today for the literature you would like to have! Owens-Corning Fiberglas Corporation, Toledo 1, Ohio.



How Fiberglas PF Dry Wall works. One highly efficient vapor barrier (1) holds back vapor. If any accidentally penetrates, it travels harmlessly through the inorganic PF insulation (2) and out into the room through the perforated wall finish (3). The insulation remains dry . . . with thermal efficiency unimpaired.

FIBERGLAS

*T. M. Reg. Owens-Corning Fiberglas Corporation

Owens-Corning Fiberglas Corporation
Dept. 185-B, Toledo 1, Ohio

Please send me the literature I have checked.

- ☐ "Insulation for Low Temperature Structures and Equipment"
- ☐ "PF Design Details"
- ☐ "Why the Trend is to Fiberglas"

Name and Title_____

Company_____

Street_____

City_____ Zone_____ State_____

JAMISON introduces FROSTOP ...a new feature

keeps doors from freezing shut

- **Prevents loss of refrigeration**
- **Helps gaskets last longer**
- **Prevents damage from prying open**

ICE FORMATION PREVENTED both at the frame and the sill area which the door gasket contacts. Jamison's new "Frostop" feature stops icing even with freezer room temperatures as low as —50°F.

HEATED METAL PLATES FOR GASKET CONTACT. They are electrically-heated and controlled by an adjustable thermostat to a temperature above the dew point of surrounding air. Since this prevents condensation, it also stops freezing.

This new "Frostop" feature is now available as an optional item on all Jamison Doors for low-temperature service. Get all the facts by writing to JAMISON COLD STORAGE DOOR CO., Hagerstown, Md.